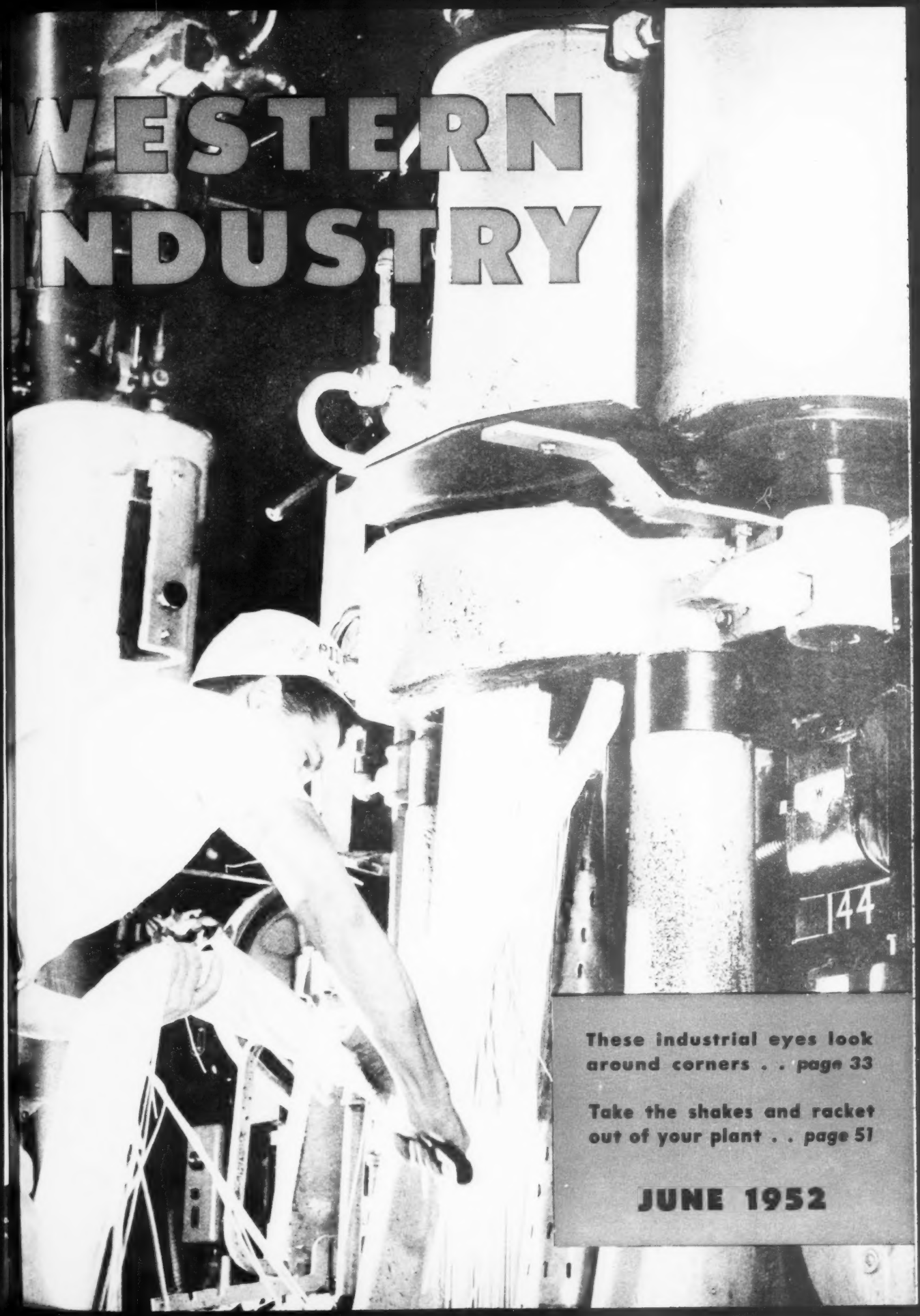
WESTERN INDUSTRY

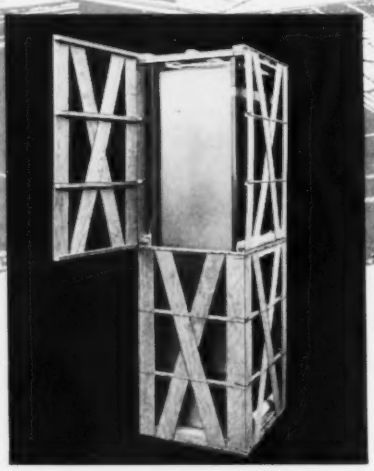


These industrial eyes look around corners . . page 33

Take the shakes and racket out of your plant . . page 51

JUNE 1952

Like giant sewing machines, Cabco's rows of "stitchers" mass-produce wirebound containers at better than eight per minute.



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WESTERN INDUSTRY

VOLUME XVII **JUNE • 1952** NUMBER 6

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FRONT COVER

Culver City, California, is famous for gigantic aircraft—fixed wing as well as helicopter, but there's more in that city than flies in the air. Here, for example, is some macaroni in process of being manufactured at the plant of Pillsbury Mills, Inc. Foodstuff, incidentally, is a major California industry.

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It takes lots of steel to raise your food!

Western farms used 100,000 tons of steel last year

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(From Alcoa's film lending library)

Spinning	16 minutes
Drawing, Stretching, Stamping	22 minutes
Blanking & Piercing	15 minutes
Resistance Welding	12 minutes
Arc Welding	10 minutes
Torch Welding	17 minutes
Tube & Shape Bending	13 minutes
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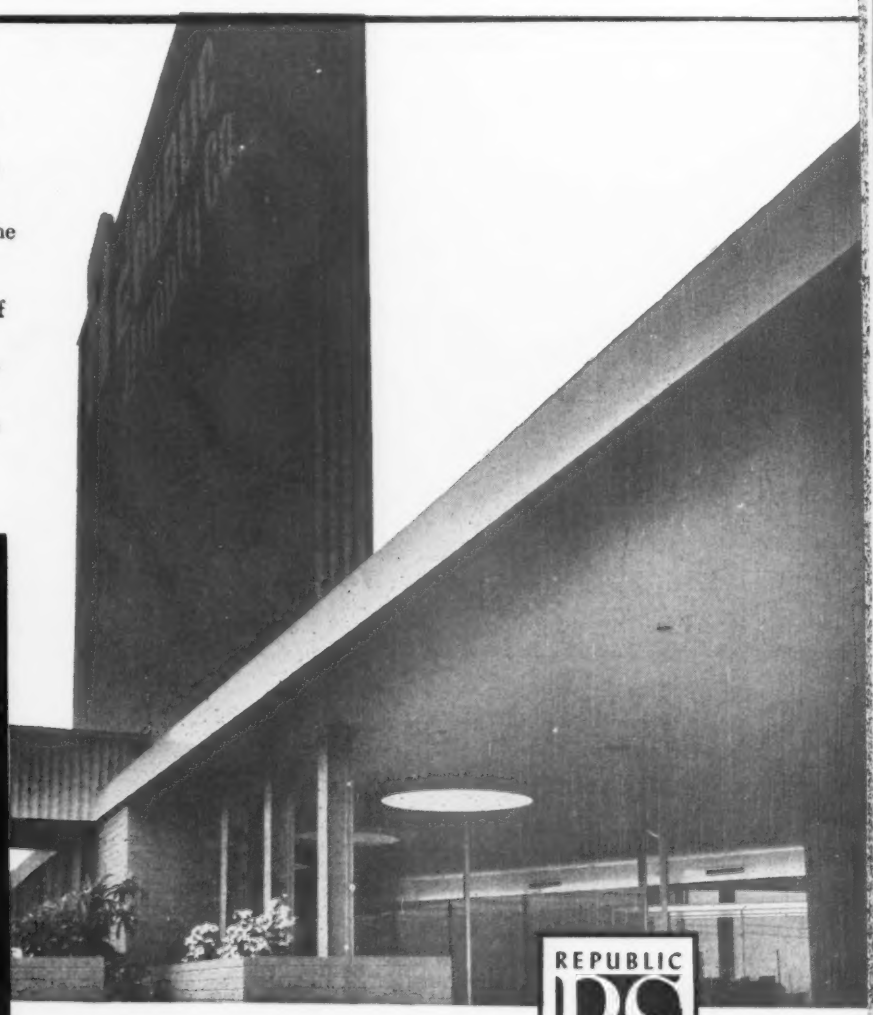

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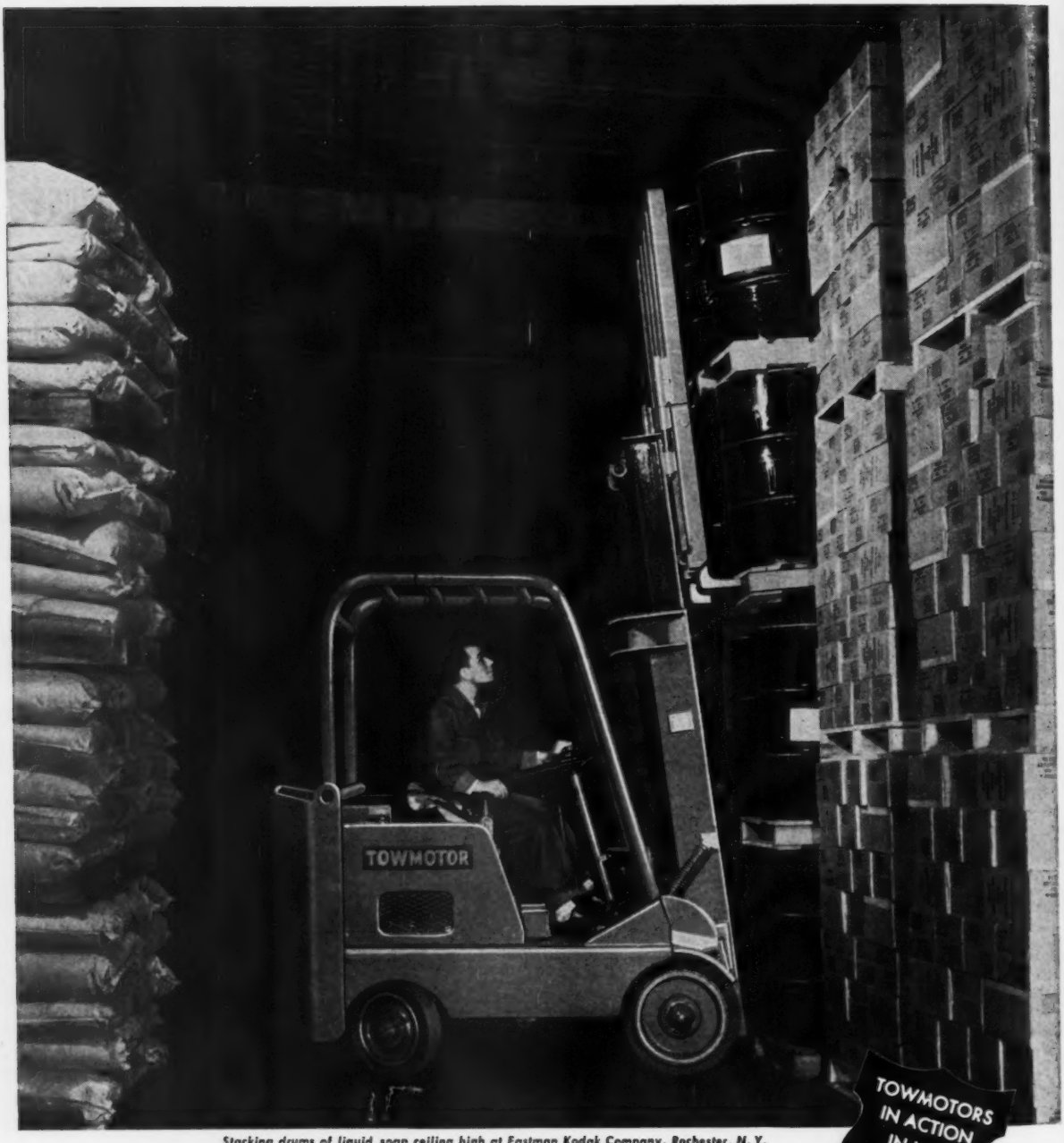
An independently owned and operated company serving Western industry



Stacking drums of liquid soap ceiling high at Eastman Kodak Company, Rochester, N. Y.

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use every inch...

stack to the roof, save space, double your storage area. You can do it easily, quickly, economically with a Towmotor fork lift truck. Towmotor handles all types of material. For the name of your nearest Towmotor Representative and a copy of Towmotor's tabloid size magazine on materials handling, write Towmotor Corporation, Div. 67, 1226 E. 152nd St., Cleveland 10, Ohio.

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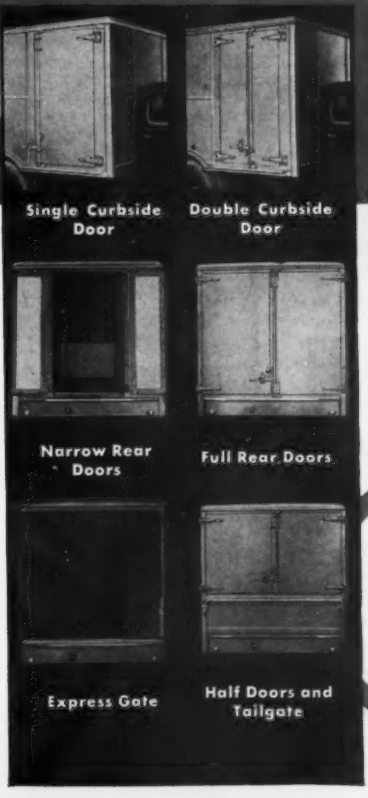

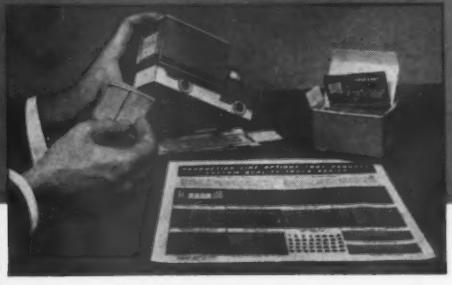

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And you'll also be glad to know the famous "Unit-Built" Body gives you all these extra advantages!

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- ★ Immediate Assembly!
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FRUEHAUF
"UNIT-BUILT"
Truck Bodies

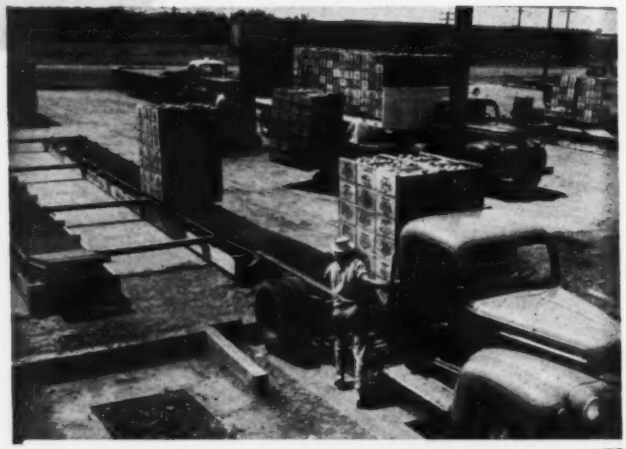
You should be in

WESTERN INDUSTRY's

PACKAGING & MATERIALS HANDLING ISSUE

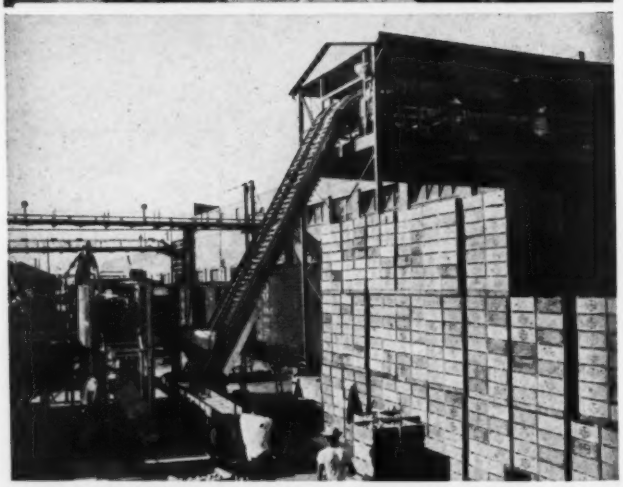
The August issue is timed to tie in with the Western Packaging & Materials Handling Conference and Exposition, Los Angeles, August 12-14.

Western Industry's **brass-tack editorial on materials handling and packaging will assure you an unusually receptive audience and timely circumstances for your advertising.**



Regular Rates Apply

Remember, you get this big bonus interest at *Western Industry's* regular rates. Write, wire or airmail your space reservations NOW.



Final forms close July 18... reserve your space *NOW!*

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Four tearsheets of your advertisement in the August issue will be mounted on attractive 11" x 14" display cards to help you merchandise products on display. Ask your nearest *Western Industry* representative to go over the details with you.

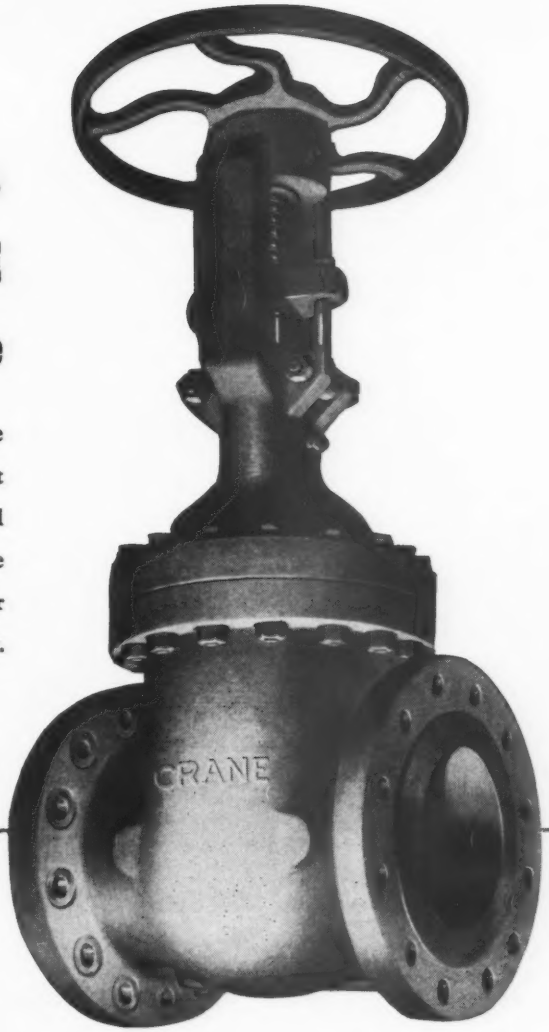
WESTERN INDUSTRY

A KING PUBLICATION

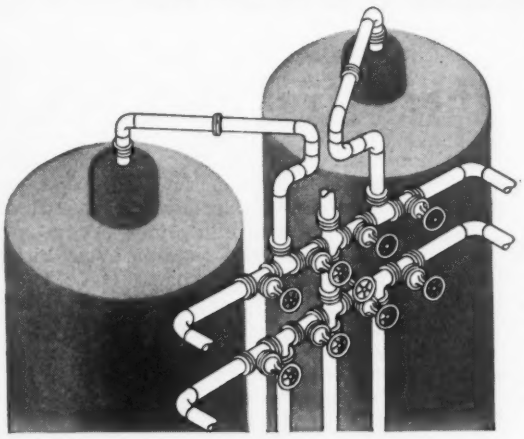
609 Mission St., San Francisco 5, Calif.

this CRANE VALVE stopped serious trouble

Here's a case that convincingly demonstrates the extra dependability of Crane valves. This plant had constant trouble with valve leakage until it was stopped by Crane valves. Read below to see why it pays to insist on Crane Quality—for greater dependability and lower ultimate valve cost.



Here are the Facts!



Where Installed: In oil refinery, on a 9-valve process control manifold. *Fluids Handled:* Straight run gasoline, air-steam mixtures, and corrosive waste gases, all at extremely high temperatures.

Trouble Encountered: Valves formerly used wouldn't stay tight. Frequent shutdowns necessary to repair leaky valves, with heavy production loss.

Solution and Result: Troublesome valves replaced with 9 Crane Alloy Steel Wedge Gate Valves. Now in service more than 2 years. No trouble; no repairs needed. All valves operating like new.

More CRANE VALVES *are used than any other make*

CRANE CO. General Offices: 836 S. Michigan Ave., Chicago 5 • Branches and Wholesalers Serving All Industrial Areas

VALVES • FITTINGS • PIPE • PLUMBING • HEATING

Republic Air Hose makes these rivet guns talk

● And it's a loud voice, too, as nearly 300 rivet guns bark out the signals that mean new railway cars in the making!

The partially fabricated cars simultaneously roll down several production lines, halting only momentarily for the embrace of husky cross hammers that sew up the metal seams with a steady, sure power beat delivered through Republic Air Hose.

As you can see, it's no easy life for a hose!

The floor's concrete and littered with sharp scraps of metal. The constantly flexing hose lies at the workman's feet. Sometimes he stands on it; sometimes he gives it a healthy kick as he jockeys for position over a line of rivets.

But despite the kicks and cuts and bruises and the high pulsating pressures, expected on jobs like these, Republic's Air Hose continues to deliver.

It's so good, in fact, that this particular manufacturer has been using Republic Air Hose since 1929. The hose is bought in long reels and, as required, lengths are cut for use on the giant forming presses, riveters, paint guns, dryers . . . in fact, Republic Air Hose is used on every bit of air-operated equipment in this plant.

And naturally, it's all purchased from a local Republic Distributor, who's always available for immediate deliveries or on-the-spot advice regarding proper selection and care of all types of Industrial Rubber Products.

There's a Republic Distributor near your plant who can give you similar service. Get to know him now!

Simply drop us a card and we'll have him call at your convenience.

Remember, Republic has been **the** specialist in the field for 52 years and—**if it's made of rubber, Republic builds it better!!**

INDUSTRIAL RUBBER PRODUCTS BY
REPUBLIC RUBBER DIVISION
Lee Rubber & Tire Corporation
YOUNGSTOWN, OHIO

LEVER BROTHERS COMPANY
LOS ANGELES, CALIF.

World's Most Modern Soap, Shortening and Detergent Plant

HORN PRODUCTS SPECIFIED AND USED BY BECHTEL CORPORATION

Los Angeles—Builders for Industry

for important decorative and protective purposes

HORNSTONE — A chemical treatment for dustproofing and hardening concrete floors to a flint-like surface.

STAY BRITE — A combination of coloring materials and water-resistant compounds added to cement for coloring and protecting concrete and cement mortar.

HORN LUX — A penetrant sealer for new terrazzo, composition and colored concrete floors.

HORNBRITE — A concentrated liquid for cleaning and sealing terrazzo and composition floors, preventing pitting and chipping.

VULCATEX — Elastic caulking compound to produce watertight joints in masonry construction.

HORN SUCTION SEALER — A primer applied to interior plaster and virgin masonry to minimize absorption and provide a uniform foundation for painting.

SYMENTREX — A pigmented exterior coating for painted or unpainted masonry surfaces to retard moisture penetration and for decoration.

HORN INDUSTRIAL ENAMELS — Durable coatings for pipe line identification, industrial equipment and safety markings.

HORN SPECIAL INTERIOR ENAMELS — For protection and decoration of interior surfaces with washable, durable finishes. Specially formulated.

HORN ALUMINUM PAINT — A completely dispersed aluminum paint for exterior and interior uses requiring a uniform, highly resistant, smooth and protective coating.

DEHYDRATINE NO. 2A — A transparent and colorless coating for exterior application to seal porosity of masonry.

For detailed information on Horn Products write

A. C. HORN COMPANY, INC.

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10TH STREET & 44TH AVENUE, LONG ISLAND CITY 1, N. Y.

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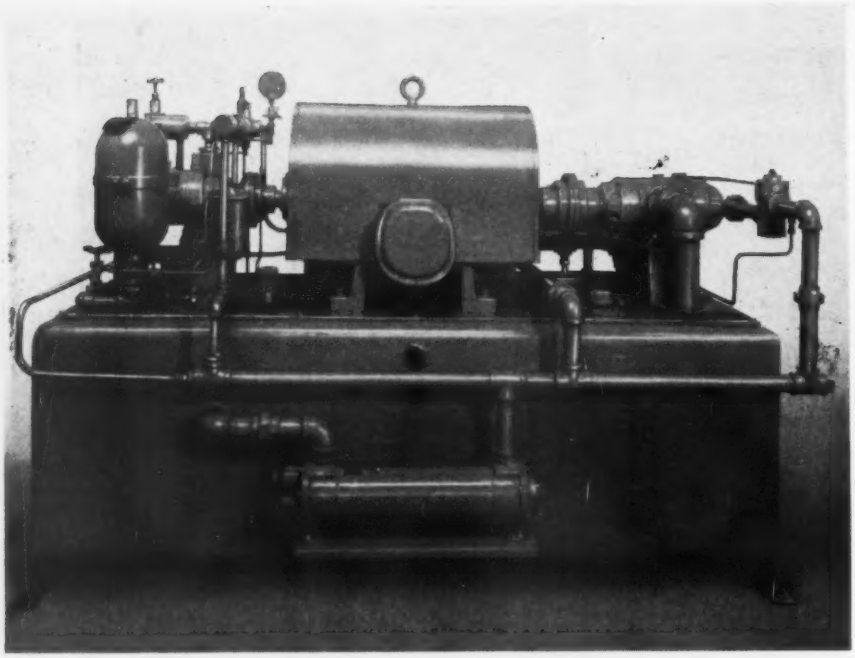

RUCKER-Designed Unit Replaces Trouble-Maker

Motors in the electric drive used by Idaho Concrete Pipe Co., to operate a centrifugal pipe-making machine, frequently stalled and burned out. This RUCKER hydraulic power unit completely eliminated the difficulty; also provided infinite speed variations with nearly constant torque plus quicker response and smoother operation. Unit is driven by 75 hp. motor, has 2 pumps (64 g.p.m. and 18 g.p.m.), 300-gal. tank, micronic filter, and is built to operate at 1750 p.s.i.

Need High or Low Pressure Hydraulic Power? Consult Rucker

If your production or testing requires high or low hydraulic pressures or a combination of both...smooth, accurate operation with quick starting, stopping and reversing of machines...variable speeds, horsepower and torque...stationary installation or power that's free to move where needed, outline your needs to Rucker.

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RUCKER is the West's largest firm specializing in fluid power problems. We are equipped to do the complete job of designing and building to your exact needs; whether it be conversion of older installations to faster operation or development of a completely new system.

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- Manufacturing facilities enable us to assemble and shop test before delivery.
- RUCKER handles the entire job, from analysis through installation.

Why not discuss your power transmission problems with a RUCKER field engineer NOW? Phone, write or wire TODAY. No obligation.

Rucker Has Built Power and Control Systems For...

Chemical & processing equipment
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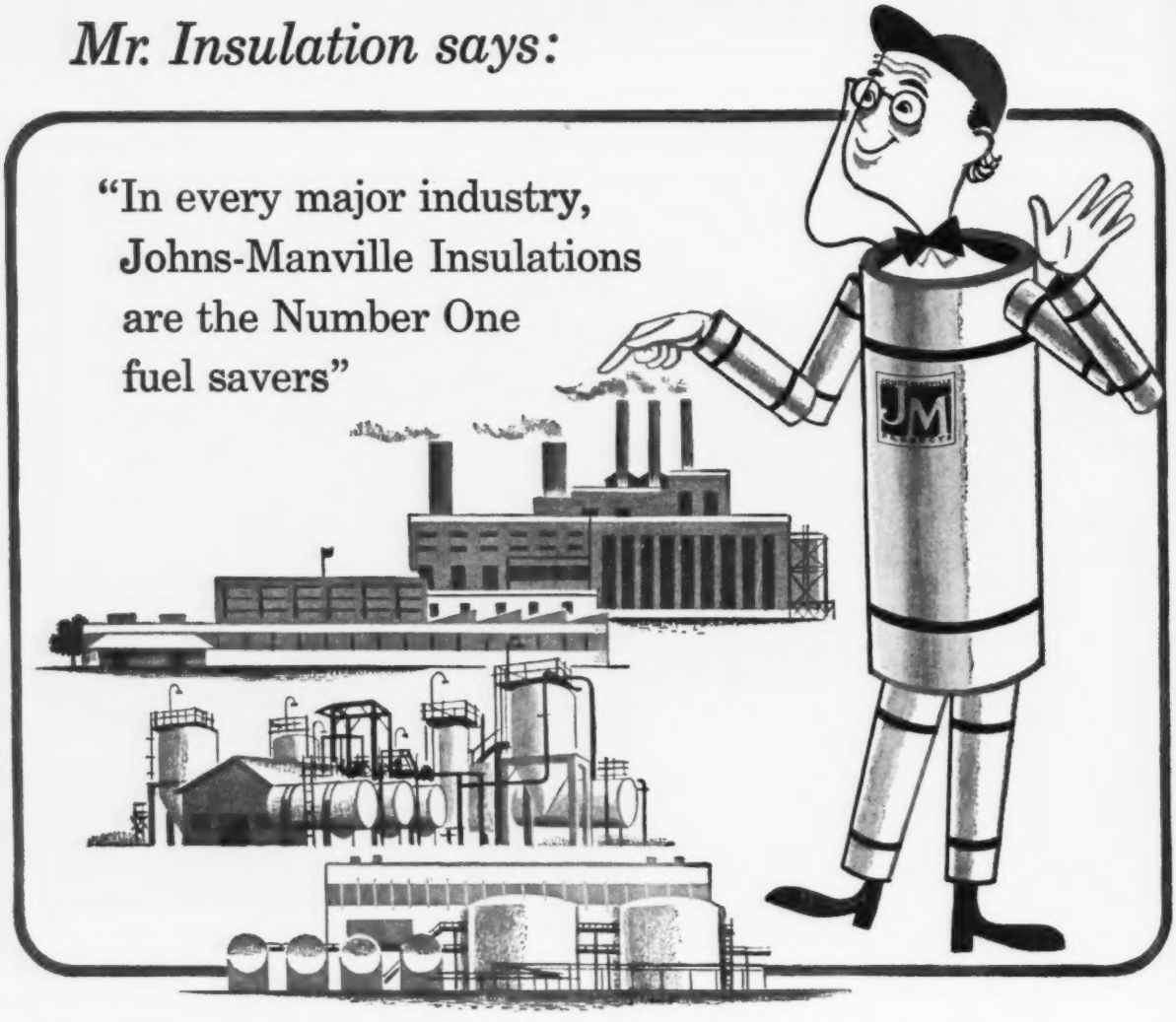

IN PLANTS with stacks or stills, tanks or towers, the story is the same—"Insulation by Johns-Manville" means the maximum return on your investment. There are two good reasons for this:

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Why not get the complete picture? Call on insulation headquarters when your next job is in the planning stage. Just write Johns-Manville, Box 60, New York 16, N. Y.

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EDITORIAL COMMENT

New Traffic Patterns

SURPRISING CHANGES in the traffic pattern could very easily be revealed in the prospective ICC hearings in the next few months on extending into Mountain-Pacific territory the proposed nation-wide uniformity of class rates for rail freight.

The practical extinction of intercoastal water movement is already beginning to have far-reaching effects. For example, it was brought out at the recent Wood Products Clinic in Spokane by Prof. John A. Guthrie of Washington State College, a recognized pulp and paper economist, that pulp mills no longer need to locate on tidewater but are free to move inland to take better advantage of raw material sources.

It would be highly interesting also to have the effect of long-distance trucking assessed. Both the number of common carriers operating between California and the Pacific Northwest, and between Coast points and the Middle West and their daily schedules, have been steadily increasing in the last ten years or more. In times when carloadings are falling off, the record of truck crossings of the California state boundaries, both north and east, continues to grow.

Other trends of equal or even greater interest may appear. The hearings may be historic.

Why Regulate At All?

IT IS A refreshing break in the monotonous cries about too much government regulation to hear someone in industry admit that the prime cause is mainly industrialists who have tried to gain an advantage by promoting government regulation of their competitors. That is just what A. G. Anderson, president of the National Industrial Traffic League and general traffic manager of Socony-Vacuum Oil, told a joint luncheon of transportation groups in Los Angeles last month in regard to the current "government stranglehold" on American transportation.

"I shudder when I think about what these various types of carriers do to each other in encouraging the tendency at all levels of government to increase regulation of transportation," he said, and recalled the statement of someone else that "we never would have had the motor vehicle if its progress had been regulated according to the effect on the blacksmith, the harness makers and the horse breeder."

Women in Business

SEEMS TO US the time has arrived to do something about the problem of women in business, i.e., about how to address them by letter when they merely sign themselves "Mary Jones." Couldn't some smart individual work up something comparable to "and/or," so that Mary Jones could be addressed as "Mrs/Miss" or something else equally safe when you don't know for sure just which she is? Of course if she was "Mrs." and is now going back to "Miss," perhaps a temporary form of salutation such as "Near Miss" could be agreed upon. But if she is going in the other direction, the situation presents complexities into which we would hardly dare to venture.

IN OUR MAILBOX

Unwasted Wood Waste

Editor, *Western Industry:*

In "Wood Waste," Mr. Mater has done such a good job of describing the new interest and recent developments in the entire field of wood waste and utilization in the Northwest and in the country at large that I would like to have enough copies to use as a portion of a release for our Equipment Handbook. This will means some 775 copies.

W. S. BROMLEY
American Pulpwood Association
220 East 42nd Street
New York 17, New York

(Mr. Bromley refers to the article "Wood Waste; What Shall We Do With It?" in the April issue, by Milton Mater of Corvallis, Oregon. In the May issue appeared another article dealing with one aspect of wood waste entitled "Wood Chips Save the Day" by Harold Olson, American Forest Products Industries, Portland.)

* * *

Where the Bombs Burst

Editor, *Western Industry:*

The magazine has been reviewed by our engineers and we feel that it would be extremely beneficial in keeping abreast of recent developments. It will be greatly appreciated if you would place my name on the mailing list for future issues of your magazine and I shall make it available to all the personnel in my office.

SETH R. WOODRUFF, JR.
Field Manager
United States Atomic Energy Commission
Las Vegas Field Office
Las Vegas, Nevada

(Military and other government installations are important adjuncts to Western industrial operations, because of the amount of equipment and supplies they use, and also because unclassified technical know-how is diffused through nearby industrial establishments.)

* * *

A Noteworthy Account

Editor, *Western Industry:*

I have received the copy of the January issue of *Western Industry* which you so kindly forwarded to me at the request of Mr. Sheldon T. Dahl.

You are to be congratulated on this most noteworthy account of the many phases of industry which have been responsible for the remarkable over-all growth of the West.

I appreciate your courtesy in affording me an opportunity to review this issue.

E. D. POWERS, Vice President
American Cyanimid Company
New York City

(Unmistakably, we note a remarkable overall growth—and increasing interest—in the Western industrial picture, by such executives as Mr. Powers. That, in itself, is one of the fundamental reasons for our Western growth. It's healthy.)

What Size Building Do You Need?

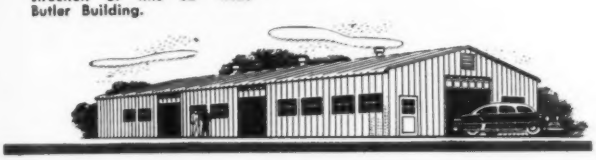
Butler Packaged Buildings like this one meet a wide variety of industrial needs—at low cost.

There's a BUTLER BUILDING

(STEEL or ALUMINUM)

to Fit Your Requirements

Maximum usable space is assured by rigid frame construction of this 32′ wide Butler Building.



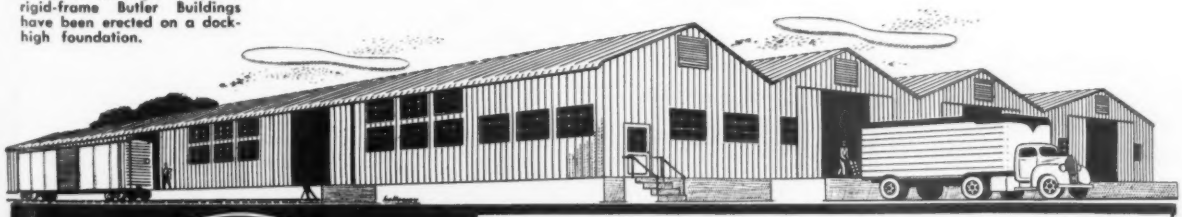
Yes, low cost, fire-safe, adaptable Butler Steel Buildings answer your need for variations in width, length, height. And Butler straight sidewalls and truss-clear, column-free construction assure full usable space.

Butler Steel Buildings are made at our Richmond, Calif., plant, for convenient delivery to West Coast industry. In days instead of weeks, your Butler Building can be ready for long-life use. For a Butler Steel Building to fit *your* needs, see your Butler dealer or mail this coupon today.

Adaptability is illustrated by special front of this 60′ wide Butler bowstring truss building.

Straight Sidewalls . . . Use All the Space You Pay For

Plenty of space to meet any requirement can be provided by multiple-unit installations of Butler Buildings. Here, four rigid-frame Butler Buildings have been erected on a dock-high foundation.



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THE COLORADO FUEL & IRON CORPORATION CF&I

CALENDAR OF MEETINGS

June 22-25—National Plywood Distributors Assn., at Hotel St. Francis, San Francisco. Contact B. E. Babitt, 20 N. Wacker Drive, Chicago, Ill.

June 23-24—National Concrete Masonry Assn., Board of Directors, at Hotel Fairmont, San Francisco. Contact A. G. Streblow, Basalt Rock Co., Napa, Calif.

June 23-July 5—Oregon State College 4th Institute of Northwest Resources at Corvallis, Ore. Contact Dept. of Natural Resources, Oregon State College, Corvallis, Ore.

June 25-27—Pacific Coast Paper Box Manufacturers' Association convention at Arrowhead Springs Hotel. Contact H. H. Worth, 315 W. 9th St., Los Angeles 15 for further information.

July—West Coast Industrial Editors Conference, in Los Angeles, Calif. Contact W. H. Cole, 2700 E. Olympic Blvd., Los Angeles 23, Calif.

July 21-25 — Stanford University's 11th business conference for graduate school of business.

July 21-25—Conference on Clays and Clay Technology, at Berkeley campus, University of California. Discussion topics include the structure, fundamental properties, and methods of identification and investigation of the clay minerals, and their uses in various fields of practical interest. Contact Dr. Joseph A. Pask, Division of Mineral Technology, University of California, Berkeley 4, Calif.

Aug. 11-13—Society of Automotive Engineers meeting, at Hotel Fairmont, San Francisco. Contact John A. C. Warner, Sec. and Gen. Mgr., 29 W. 39th St., New York 18, N. Y.

Aug. 12-14—4th Western Packaging and Materials Handling Exposition, Shrine Convention Hall, Los Angeles. Contact Clapp & Poliak, Inc., 769 Monadnock Bldg., San Francisco.

Aug. 13-14—Second biennial Packaging and Materials Handling Institute, Shrine Auditorium, Los Angeles. Contact: John R. Huffman, Department of Industrial Engineering, University of Southern California, Los Angeles.

Aug. 19-22 — American Institute of Electrical Engineers, Pacific General Meeting in Phoenix, Ariz. Contact H. H. Henline, 33 W. 39th St., New York City 18, N. Y.

Aug. 27-29—Western Electronic Show and Convention, Long Beach Municipal Auditorium. Contact Heckert Parker, 108 Ninth St., San Francisco, Calif., HEmlock 1-2525.

September—California Association of Port Authorities state convention.

Continued on page 28

BUDA "FT" SERIES Fork Lift Trucks

Get the OK *from all three!*

14 STANDARD MODELS...Capacities to 7500 lbs.

BUDA DIESEL or GASOLINE POWER

See the new FT Series Fork Trucks at your nearby Buda Distributor. Spend ten minutes looking them over . . . watching them operate and you'll agree that these new trucks were produced by men who know fork truck design and construction. Streamlined, powerful, rugged, the new Budas are way ahead in every way. See them today and get complete details. Write for Bulletin 1570. There is no obligation. *The Buda Company, Harvey, Ill.*

BH-39

MANAGEMENT

"Diesel powered Budas have cut fuel costs 50 to 60%, and maintenance is negligible. Under hard use, these new Budas are giving better service than anything we've seen."

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"Simplest trucks to service and maintain. Everything—engine, battery, fuel, electrical and hydraulic system—is easy to get at. Making the counterweights and panels removable leaves the whole truck wide open . . . makes maintenance faster, easier."

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"These new Budas are a breeze. I can handle more loads now than ever before. Easier to operate, too. Controls and instruments are placed just right. The guys who built this truck must have been operators."

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Joe Coursey Equipment Co.
Denver Colorado

The Lang Company
Salt Lake City 9, Utah

Roll-Rite Corporation
Oakland 7, California

Motor Power Equipment Co.
Billings, Montana

Air-Mac, Inc.
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PALLET LIFT-TRUCKS

Barrett Handling Equipment

For Money-Saving Short Hauls . . . Load Spotting General Pallet Handling

Model EX Hydraulic Pallet Lift-truck. Capacity 2500, (4000 and 6000 lb. capacities available). 25", 27" or 30" frame width. Fork length, 36" to 60". Height, lowered 3¼". Lift, 4".

Here's the last word in safe, economical handling of single or double-faced pallets. It's made for fast, easy operation . . . *built for years of service.* The improved Model EX is ideally suited as auxiliary equipment, often eliminating the expense of power truck operations.

Barrett Pallet Trucks *need less operating space* with their short turning radius—get into tight corners with no lost-time gaps; materials movement is continuous. Standard 4" lift prevents snagging. Complete hydraulic lifting and lowering—with any desired number of strokes to raise the load. It gives you operation for light loads—less effort for heavy ones. Just step on release treadle to lower.

Check ALL the features and you will know why Barrett Hydraulic Pallet Trucks are industry's choice.

For skid handling . . . the Model ED, powerful Barrett Hydrolift Junior with full hydraulic multi-stroke lifting and lowering. Widespread front wheels for stability, even with high loads. 2500, 4000 and 6000 lb. capacity. 4" lift. 17⅜" and 24¾" widths.

Barrett Steeleg Skid eliminates needless extra handling. Material stays on skid from loading to destination. Platform type, box type, stake type, Write for Bulletin 4882.

HAND LIFT-TRUCK—MODEL J—Single stroke type lift-truck; popular all-round model—2500 lb. capacity. Model R—4000 lb. capacity. Ask for Bulletin 5110.

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P&H is the only crane builder producing complete electrical equipment for overhead cranes. P&H electric motors are designed specifically for crane service — for frequent reversal, with ample safety factor. P&H crane controls are designed for a single purpose — to insure the perfectly coordinated performance to meet your job requirements — and keep it that way! When you specify P&H crane electrical equipment, you can look to this one dependable source for complete service. There are no delays — no buck-passing. P&H — America's leading crane builder — welcomes this complete responsibility!

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USED IN ALL INDUSTRIES

To quote from a report of their Engineering Department

"Under actual tests, LUBRIPLATE extended bearing life fifty per cent or better as compared to other lubricants tested at that time. It was also found that, during test, LUBRIPLATE increased efficiency of machines twenty per cent by reducing friction loss. Republic has been using LUBRIPLATE successfully for the past eight years."

LUBRIPLATE Lubricants are different from all other lubricants with properties all their own. They reduce friction and wear, prevent rust and corrosion and save power.

LUBRIPLATE Lubricants are available from the lightest fluids to the heaviest density greases. There is a LUBRIPLATE Product best for your every lubrication requirement. Let us send you case histories of savings that others in your industry are making through the use of LUBRIPLATE Lubricants. Also packed in handy tubes for use in portable tools, guns, fishing reels, lawn mowers and household appliances.

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Dealers Everywhere . . .
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LUBRIPLATE *The Modern Lubricant*

CALENDAR OF MEETINGS

Begins on page 24

Contact Dudley Frost, Suite 215, 1419 Broadway, Oakland, or Alvin K. Maddy, 1333 El Embarcadero, Long Beach.

Sept. 3-5—Pacific Coast Gas Association Conference, in Los Angeles, Calif. Contact Clifford Johnstone, 447 Sutter St., San Francisco 8, Calif.

Sept. 10-13—Fourth annual Summer Management Conference, presented by University of California Institute of Industrial Relations through facilities of U. C. Extension, will be held at Ahwahnee Hotel, Yosemite. For additional information, contact Department of Conferences and Special Activities at U. C. Extension, Berkeley, Calif.

Sept. 12-16—Tenth National Instrument Conference and Exhibit, Los Angeles, Calif.

Sept. 14-20 — Concrete Reinforcing Steel Institute, semi-annual meeting, at Broadmoor Hotel, Colorado Springs, Colo. Contact Association headquarters, 38 So. Dearborn St., Chicago, Ill.

Sept. 15-18—American Mining Congress Metal Mining Convention and Exposition, in Denver, Colo. Contact J. D. Conover, 1102 Ring Bldg., Washington 6, D. C.

Sept. 22-25—American Mining Congress, biennial metal and nonmetallic mineral mining convention and exposition, in Denver. Contact Society headquarters, 1200 18th St., Washington, D. C.

Sept. 28-30—Pacific Northwest Trade Association, fall conference, Yakima. Contact D. C. Knapp, executive secretary, 219 Olympic Hotel, Seattle.

Oct. 1-2—California Manufacturers Association statewide meeting. Contact Mr. John Knauft, 315 W. 9th St., Los Angeles 15.

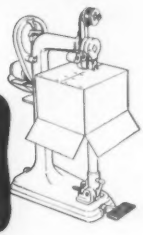
Oct. 11-14—National Association of Waste Material Dealers, fall meeting at Hotel Ambassador, Los Angeles. Contact association headquarters, 271 Madison Ave., New York.

Oct. 12-16—National Canvas Goods Manufacturers Association national meeting. Contact Fred W. Behnke, 1132 Mission St., San Francisco.

Oct. 17-18—Northwest Personnel Association regional conference at Davenport Hotel, Spokane, Wash. Contact Marion R. Jenkins, Whitworth College.

Oct. 21-23—28th Pacific Coast Management Conference, at Claremont Hotel, Berkeley. Contact Everett Van Every, Secty.-Mgr., California Personnel Management Association, Farm Credit Bldg., Berkeley 4, Calif.

Acme Steel Stitching Insures S.A. *(Safe Arrival)*



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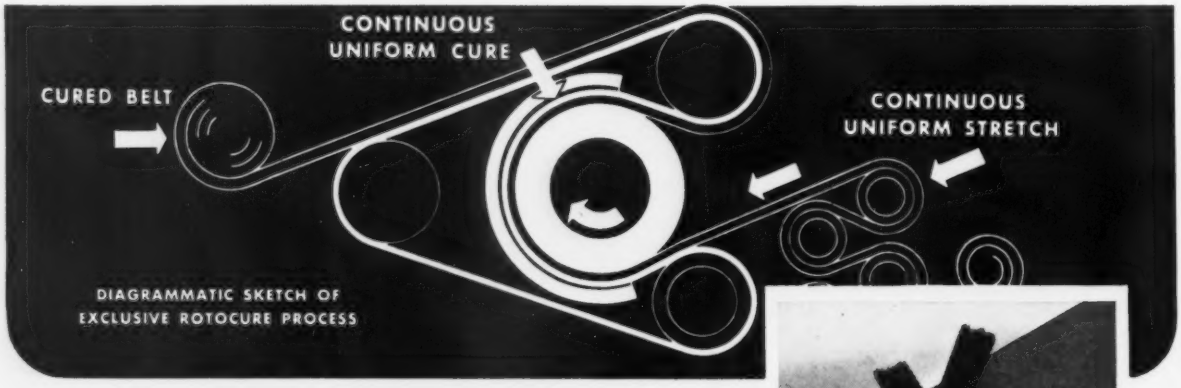
Shippers everywhere are using Acme Steel wire stitchers to help reduce the annual loss of goods lost or damaged in transit estimated last year at $160,000,000. Help the National Association of Shippers Advisory Boards by making your company's Perfect Shipping Campaign a year-round effort.

For Continuous Operation



Buy a Belt that's Continuously-made

(Rotocured BWH Conveyor Belts have no OCS*)

Belts made by the conventional flat press method of "start and stop" curing tend to fail early because segments are *overcured.* Here's how it happens: A section is cured. STOP. Another section is cured. STOP. Part of the first section is cured *a second time* because the belt is advanced less than a full press length. This part of the belt becomes a weakened structure about 2" to 4" wide. These press overlaps occur *every 30' to 40'!*

The "cure" for this problem is *avoid overcuring* — and that's exactly what Rotocure avoids with its *continuous* endless technique of curing. BWH Rotocured belts thereby give users the following *specific* advantages:

1. **Increased belt flex life (up to 40%).**
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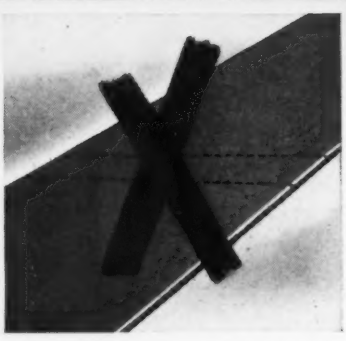
3. **Constant, uniform stretch.**
4. **Uniform, abrasion-resistant covers.**

Your BWH distributor knows belts and can give you real help on your conveyor problems. Ask him for the full dollars and cents story on ROTOCURE and you'll see how your per ton costs can drop in materials conveyed. Check with him on BWH Transmission Belts too — there's another cost-saving story through operation at lower tensions.



***Overcured Sections — present every 30' to 40' in all belts made by flat press method.**

BWH — DEPENDABLE RUGGEDNESS

Another Quality Product of

BOSTON WOVEN HOSE & RUBBER COMPANY

Warehouse Stock: 111 N. Canal St., Chicago, Illinois **Distributors in all Principal Cities**

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PRACTICAL ANSWERS TO *YOUR* fastener problems

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. . . Whether you need standard or special fasteners, "National" can supply your needs. We produce a complete line of standard fasteners right here on the West Coast. We can make special types such as those shown here for practically any need.

WHERE?

. . . "National's" Los Angeles plant is less than 24 hours shipping time from your plant. "National" sales representatives in cities indicated are quickly available to help you with your fastener problems.

HOW?

. . . "National's" modern production equipment and strict quality control—plus expert workmanship—are your assurance of top quality. You can depend on "National", as many leading manufacturers have for more than 60 years.

Write or phone . . . to your nearest "National" representative, or contact us direct.

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National PRODUCTS

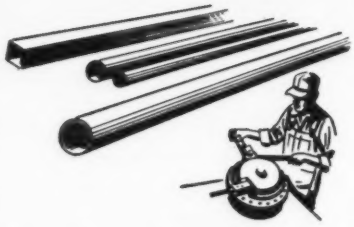
RYERSON

The Industrial P. A.'s Department Store

Here are a few of the many types of steel and related products on hand right now, ready for immediate shipment from your nearby Ryerson plant. Many may be used in place of products that are still hard to get. Check the items you need, and save time by ordering them next time you call Ryerson.

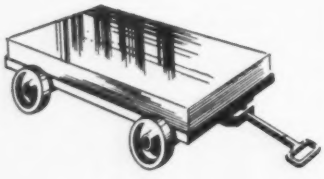
ALLOYS

Tested alloys of known hardenability, both standard and aircraft quality. Complete heat treatment guide with each shipment.



WELDED MECHANICAL TUBING

Hot and cold rolled, rounds and squares in a wide range of sizes. Consider cost. Substitute for seamless tubing.



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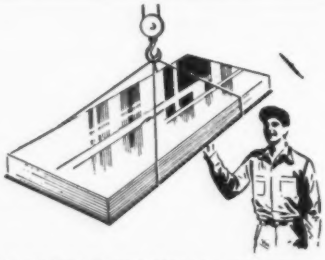
Both hot and cold rolled coming into better supply, especially cold rolled in the heavier gauges.



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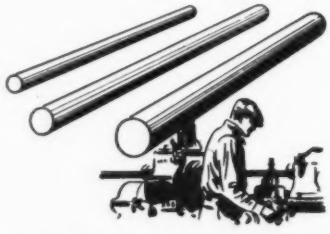
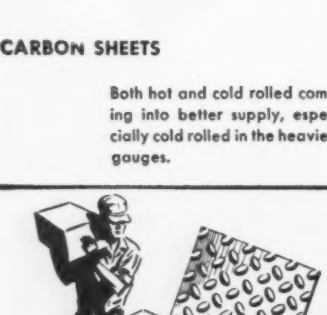
No allotment required for these stainless bars, plates and sheets—and they can often replace restricted nickel-bearing types.



TOOL STEEL

Water, oil or air hardening steel. High in quality; economical in price. Hardening data with every shipment.

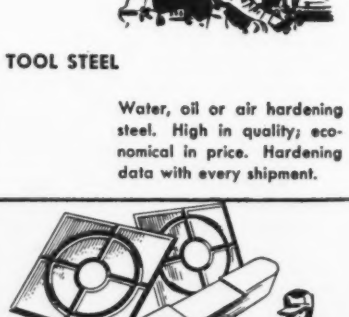


SAFETY PLATE

Strong, non-skid Inland 4-Way Safety Plate protects feet against slipping, floors against wear. Easily fabricated.

CHAIN & WIRE ROPE

Rugged, dependable TM chain, iron, steel and alloy qualities, furnished to order. High quality wire rope shipped from large stocks.



BABBITT METAL

Glyco Babbitt, an exclusive Ryerson product, has physicals equal to high tin Babbitts; costs substantially less and is unrestricted.

RYERSON STEEL

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SAN FRANCISCO PLANT: Box 188, Emeryville. Plant: 65th & Hollis Sts. Phones: OLympic 3-2933, ENterprise 10176.

WESTERN INDUSTRY
JUNE, 1952

SEE THROUGH WALLS, FLOORS, AROUND CORNERS in your plant

Western industries apply "wired eyesight" (industrial television) to control furnace operations, check boiler feed, and watch rocket firing

HOW TO SEE around a corner, so to speak, in order to control an operation, or to get accurate information when safety necessitates remote observing, are problems that industrial television is beginning to solve.

Examples in the West are aligning slabs as they go into the furnace at U. S. Steel's mill at Geneva, Utah, observing the firing of rockets at Aerojet Engineering Corp., Azusa, Calif., remote reading of water columns at Southern California Edison's new steam generating plant at Etiwanda and San Diego Gas & Electric's Silver Gate plant, and also at Etiwanda for interior viewing of the furnace.

The Geneva job is a four camera TV installation, reported to be the most elaborate closed-circuit system in industry in the country. It enables one operator to align the four-ton slabs accurately so that they can be pushed into and out of the three reheating furnaces, where they are heated to a temperature of approximately 2,300 deg. F. for rolling into plate and hot rolled strip.

In this procedure, as each slab is pushed into the charging end of the furnace, another slab is ejected at the

Since TV provides close-up of operations, pusher operator at Geneva steel mill can feed slabs into furnace himself without aid of assistant, formerly needed.

discharge end. Before the new TV installation, the pusher operator was not in a position to arrange the slabs properly for accurate pushing in and out, so an assistant helped spot the slabs as they moved along the conveyor belt.

Now two cameras are installed on either side of the operator, focused on the center line of each of the pushers, and all four viewers are in the operating pulpit. This makes it possible for the operator to see the slabs from a point directly in line with the center line of each pusher. Consequently he is able to put the slabs in line on the skids himself.

The cameras, built by Diamond Power Specialty Corp., are mounted on structural steel towers and the high intensity lighting which they require is mounted on adjacent crane runway girders. Although the cameras do not produce as sharp a picture (300 lines resolution) as studio-type tubes, they last many times as long and therefore have an advantage for industrial use.

Closed Circuit

Unlike present day TV broadcasts, ITV (industrial television) signals are not usually sent out over the ether and picked up by antennas, but transmitted by coaxial cables. Diamond's system consists of three units: camera, power supply and monitor, the power supply transmitting to the camera the necessary pulses and voltages necessary for operation.

The power supply can be separated from the camera up to a distance of 25 ft. on the standard model, while a separation distance up to 100 ft. can be had for special applications with some minor changes. The monitor or remote viewing end can be separated from the camera by a distance of 1,500 ft. If a longer transmission distance is required, booster amplifiers can be used every 2,000 ft. to keep the video (picture) signal level high so that no distortion will occur.

As the pick-up tube, known as the image dissector, is not a filamentary type, sudden high surges of light cause no detrimental effect to the cathode, and no "bloom" or memory effect is encountered, as this long life tube has instantaneous electron dissipation. The camera unit can stand temperature changes from 0 to 150 deg. F. without shielding. As the peak sensitivity of the dissector is in the near infra red region, approximately 7,800 angstroms, it permits the use of infra red lighting equipment.

Size of the camera and power supply are each 9¾ x 8½ x 16⅝ in., while the monitor is 13¼ x 16¼ x 18-11/16 in., permitting use in cramped quarters. Diamond says that a highly trained service staff is not needed, as the maintenance department or electrician can be instructed in a short time to take care of adjustments, periodic checks or tube changes.

For viewing front of furnace firing at Etiwanda, the Diamond cameras now installed look through an air-cooled window set in the rear of the furnace, which necessitates rebending the water tubes and cutting a hole in the boiler shell.

Information Right Now

The view is thrown on a screen at the operator's panel board, enabling him to tell instantly the condition of the fire and if any adjustments are required. Under the gas firing conditions involved, the ability to tell instantly whether the burners are lit is of prime importance.

As the Edison Company, like most other power companies, is going in for the larger high-pressure type boilers which require constant attention, instantaneous viewing is essential.

For the water column reading at Etiwanda and San Diego, the camera is mounted at drum level, where the gauge is scanned and the information is transmitted to the receiving unit mounted in the panel board. This gives the operator information on the water level, so that he can detect fluctuations immediately and make any needed changes without delay. Both of these are Diamond jobs.

Long-distance Eyes

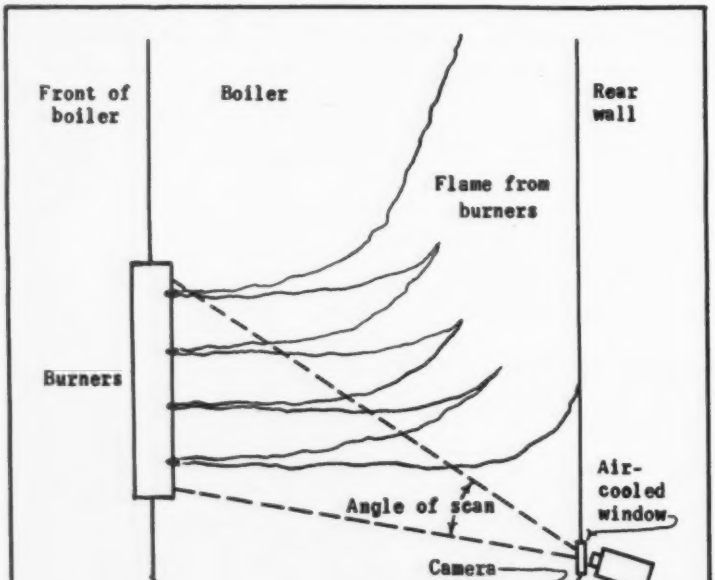
Aerojet Engineering Corp.'s problem was the difficulty of testing rockets because of the hazard involved. Control rooms had to be several hundred feet away, and direct viewing was impossible. The use of mirrors to view the firing was unsatisfactory because the angles at which the mirrors had to be set provided a very restricted view.

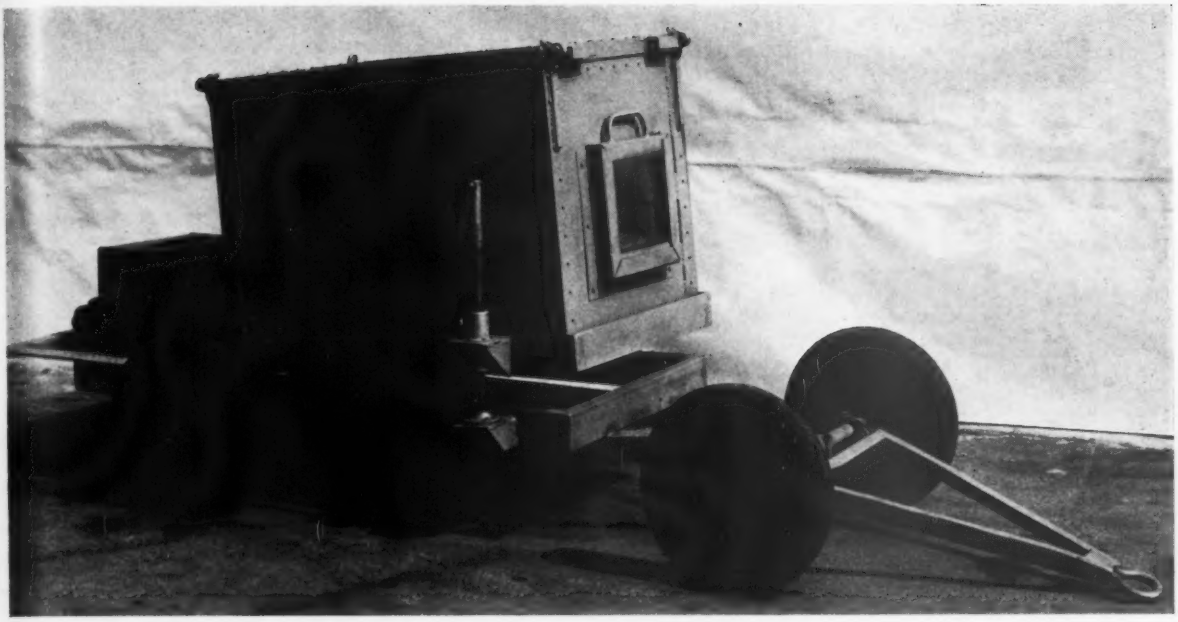
They have been using television since 1948, and a picture of an early set, boxed and bandaged to reduce shock, appeared in *Western Industry* that year. Aerojet learned that loud, high noise levels or acoustical vibration in using an ordinary commercial set for rocket viewing resulted in "microphonics" or distortion. Rocket engine firings ordinarily set up 150 decibels and sometimes the noise goes above 160 decibels, beyond the range of conventional measuring instruments.

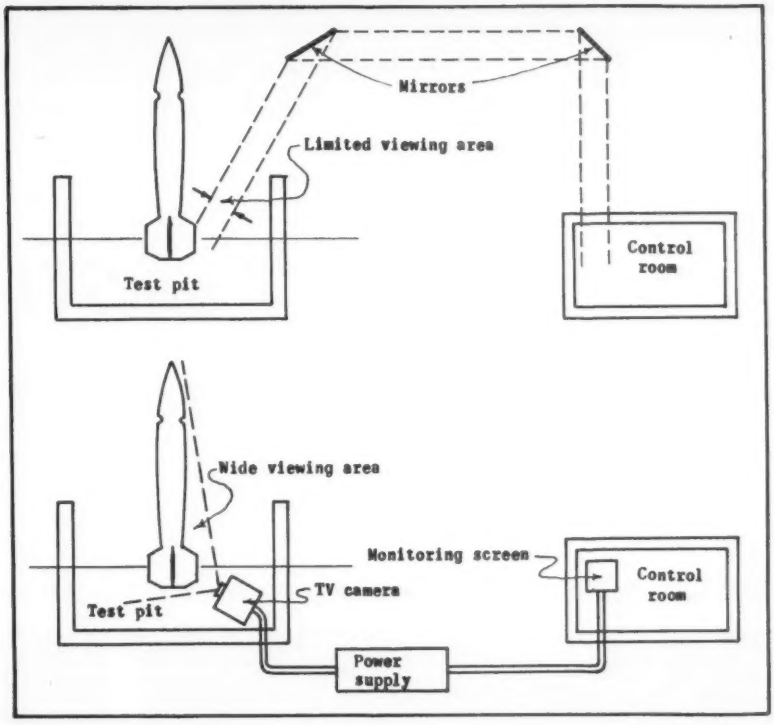
Since the camera had to be set up in the firing pit in order to get good observation, great precautions had to be taken against vibration through the ground and the air. Consequently the camera is submerged in several insulated boxes inside each other, with glass windows to permit the image to reach the lens.

The power supply is located outside the walls of the firing pit, and the monitoring screen is inside the control room. So severe are the conditions that

Constant check on gas burners under boiler becomes possible in installation going in at Southern California Edison's big Etiwanda steam generating plant.







Acoustically insulated box at Aerojet (above) permits setting up camera in areas where sound levels of over 140 db. are experienced without serious microphonic effects on the picture on monitor screen in control room. Box mounted on adjustable dolly for various sight locations. Power supply located on back of dolly. Mirrors shown at right were safe for viewing rocket firing at Aerojet, but gave only limited vision. TV now shows it all.

it is impossible to get as complete control as desired, and some distortion is unavoidable, but Aerojet engineers consider the system a great improvement over any other type of viewing.

Use of ITV has enabled the company to make changes in its test program that would not have been possible otherwise.

Aerojet uses Vericon equipment which is manufactured by Remington Rand Inc. An ordinary Vericon installation includes a 31½-lb. camera that can be mounted in any position—horizontally or vertically; a 110-volt, 60 cycle pulse-power unit, weighing 49 lb., which generates the impulses needed to activate the entire system; and a master control monitor and viewer with a 42-sq. in. screen, which weighs 42½ lb. Master controls for remotely operating the camera are recessed in the face of the viewer. Remington Rand also manufactures extension viewers which duplicate the picture on the master viewer. As many as 10 of these can be wired to the master viewer to extend as far as 4,000 ft.

Some of the improvements to make ITV equipment more durable and less expensive made by commercial manufacturers have resulted from developments pioneered by the military.

Western boatbuilding industry adheres neither to tradition nor convention. Here come the engineers with a . . .

36-FOOT PLASTIC BOAT

cast in one piece in a closed mold

HERE'S THE BEGINNING. Styrofoam blocks cut to size.

Separately wrapped blocks of styrofoam, sealed and prepared.

ENGINEERS have so far done some quite intricate things with plastics. Now they have come up with a relatively new use for the material—a 36-ft. Navy workboat, the largest plastic casting ever made in closed molds.

It was developed at Puget Sound Naval Shipyard, Bremerton, Washington, and designated LCVP (Landing Craft, Vehicle and Personnel). In design, weight and cost it is similar to the more than 20,000 wooden LCVP's built during the war years. The plastic construction has passed experimental tests so successfully that the new boat will soon be produced in limited quantities for use by the Fleet.

Plastic Boats Never Die

Engineers predict a long life for the tough plastic boat as compared with the six-year useful life of its wooden counterpart. It is produced in one piece without seams to caulk. It is unsinkable. It will neither dry out, corrode nor deteriorate from the salt water or weather as would a metal or wooden boat. It is stronger than wood and will not splinter from gun fire. It will never need painting. It requires very little maintenance of any kind.

One of the plastic LCVP's was taken to San Diego for testing at the Amphibious Training Station under combat conditions. Over 500 test landings were made with no appreciable damage to the boat. Repeated landings at full speed over a jagged obstruction failed to stop the plastic boat. Officers witnessing the tests stated that a wooden boat would have been completely destroyed by the same treatment.

Construction of the boat is a series of preliminary steps accomplished by a high proportion of unskilled labor, and climaxed by the injection of liquid resin which solidifies to form the exterior surfaces and strong interlocking webs.

Upside Down Mold

The boat is molded upside down between two metal molds, and is "built" from the inside out. The bottom or male mold is covered with one thickness of glass cloth, then three layers of glass matting and another layer of glass cloth to form the inner hull.

Next come the blocks of styrofoam which give the boat its built-in buoyancy. Layers of glass cloth and glass matting laid between the blocks of styrofoam carry the liquid resin binder to form transverse webs and a continuous strip with the inner hull. The outer hull is another series of layers of glass cloth and glass matting. Then the upper part of the mold is sealed in place and the injection of resin begins.

The mixture of resin, pigment, pine oil, glycol, xylene and catalyst flows into the mold at the rate of about ten pounds per minute. Allowing for a period of leveling, a total of about eight hours is required to complete the injection. After 40 hours the top mold is removed and the 6,000-lb. hull is lifted off—complete except for minor patching and sanding down of high spots.

Experience Counts

When Puget Sound Naval Shipyard was assigned the project of developing the plastic LCVP, its engineers had already successfully molded a plastic 12-ft. wherry which is now in use in the Fleet, and thus were familiar with the problems involved in molding a boat three times as long.

When the yard was ordered to produce the 36-ft. boats, methods of multiple injection, intricate mold arrangements and new layup methods had to be developed. E. A. Thompson, of Bremerton, chemical engineer of the material laboratories, carried out tests to determine rates and gel times of polyester resin and the effect of large volumes of the thicker sections on the exothermic rate.

A Problem

One of the principal problems encountered and solved in the making of the 36-ft. LCVP was selection and installation of the buoyancy material.

Styrofoam was selected as the best available material because of its light weight, strength, unicellular and water-resistant qualities. Its one unfavorable characteristic is its solubility in the styrene of the resin. After many tests, a method of sealing each block of styrofoam was devised.

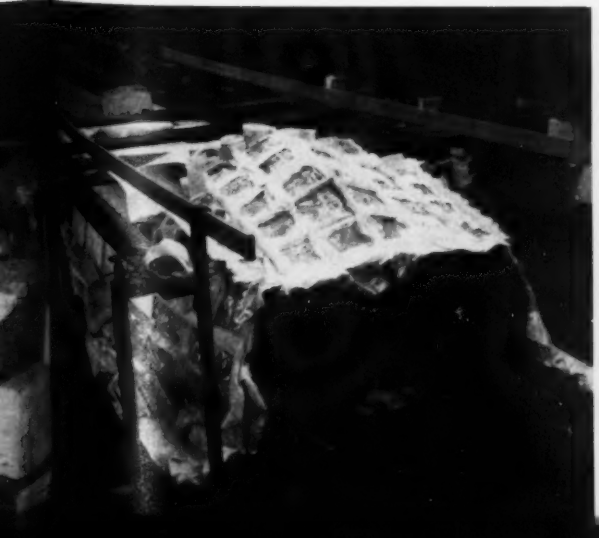
The styrofoam buoyancy material is purchased as slabs 4 x 12 x 36 inches. They are glued together to form blocks and cut to size and shape by the use of templates. The shaped block is then coated with Weldwood glue containing 20 parts of pine oil per 100 parts of dry glue.

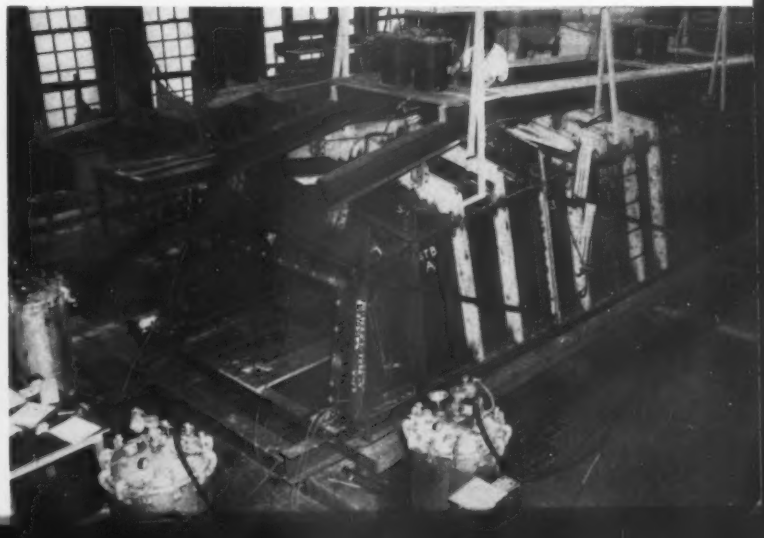
Kraft wrapping is next placed around the block, and the seams sealed with masking tape. The paper-wrapped block is given two brush coats of Saran latex that has been thickened to brushing consistency with Methocel. When the Saran coating is dry the block is placed in a pan of styrene and rotated until all surfaces are wetted.

If the coating contains a pinhole, the styrene will stain the paper. Leaks are repaired by applying more Saran latex to the area. The block is tested again for leaks and if none are found it is placed in a sheet PVA (polyvinyl alcohol) bag and two drops of methyl chloride added before the final seam is heat sealed.

A General Electric Leak Detector

Lay-up of forward section showing completed mold construction. Molds closed showing resin pots and recirculating pots on risers.





model H is used to test the PVA bag for leaks. Leaks are repaired by heat sealing a patch of PVA over the leak. The surfaces of the PVA film must be moistened with a 50 per cent water-alcohol solution before heat sealing.

If it passes the test, it is ready to be placed on the male mold . . . with interlocking strips of glass matting and glass cloth between the blocks to carry the resin. During injection of the resin and continuing the gel point a vacuum is maintained in the molds to assist in expanding the PVA bags, thus compressing the glass mat forming stronger webs and hull laminate.

Role of Steel

Molds for the plastic LCVP presented their own problems. They are constructed of steel plate, with a foundation consisting of two 12-in. I beams resting on 8-in. x 8-in. wooden ties . . . the base of the male mold installed on 6-in. channels.

The male mold is constructed of 5-lb. steel plate, welded to angle bars and assembled in sections by the use of rubber gaskets and bolts.

The female mold is constructed of 14-gauge sheet steel, supported on angle bar. It contains risers and sight tubes to measure the height of resin during injection. I beams bolted to the top of the mold contain lifting pads used to install the female mold on the male mold. The two molds are bolted together.

In preparing the molds, the female mold is dismantled into 13 sections. The male mold remains in one piece. The rubber injection troughs are coated with Saran latex for protection. One inch cellophane (Scotch) tape is placed over the edges of all rubber gaskets and the joints between the life jacket recess boxes and the mold proper.

The molds are cleaned with acetone and given two coats of Johnsons' floor wax. Bingham Brothers parting agent L378 is sprayed over the wax. An eggshell or overlay spray coating of pigmented resin is then applied.

Glass Mat

There were several problems in working out the new lay-up of glass cloth and glass mat. Glass cloth No. 1000 is placed on the male mold. Three layers of polyester bonded glass mat, 1½ oz. per square foot, is laid over the glass cloth. Another layer of glass cloth No. 1000 is placed over the mat to form the inner hull.

Metal inserts and styrofoam blocks are placed on the glass cloth. Webs are formed between the blocks using two layers of glass cloth and two layers of glass mat. The glass extends around the edges of the blocks forming T-joints with the hull and longitudinal webs.

The outer hull is laid up in a similar manner to the inner hull, except that an extra layer of glass mat is placed on the forward bottom section to produce a ¼-in. scuffing area laminate.

After the lay-up is made, the various panels which make up the female mold are set in place and bolted (to gunwale, bow or other mold sections). The finished mold is tested for tightness by applying air pressure, and soap solution applied to all joints and possible locations of leaks. When the clamps are removed from the vacuum lines, the mold is ready for injection.

Injection pots are standard 60-gal. DeVilbiss paint spray pots with built-in air motor and stirring paddles, thus permitting convenient mixing in the pot. The injection of the resin mix is from five of these pots each containing 500 pounds of resin plus pigment, pine oil, glycol and xylene. The catalyst is added with the xylene to wash it in, and the mixture thoroughly stirred.

When the signal is given, the accelerator is added and stirred in. Pressure is applied to the pots and vacuum maintained on the molds.

Right Side Up to Finish

This plastic LCVP requires five injection troughs to introduce the resin into the glass cloth, glass mat lay-up. It is molded upside down using a trough for each gunwale and three troughs across the inside bottom section. When the plastic has set up, the outer (female) mold is removed. The plastic LCVP is then lifted off, turned over, and outfitted.

Although the 36-ft. landing craft are quite satisfactory at present, and the basic problems have been licked (development of multiple injection methods, intricate mold arrangements, and new lay-up methods), further investigations are being made to find a buoyancy material which is not soluble in the styrene in the resin.

Rear view of plastic LCVP on male mold. Boat is now ready to be turned over and fitted out.

Making the 36-ft. LCVP plastic boats is about the same as manufacturing the 12-ft. plastic wherries, except the buoyancy material is constructed into the former, and metal rather than plastic molds are used. Metal molds cost more, but they are better from a production standpoint and maintenance.

Low cost, high strength, long life, ease of repair and low maintenance problems were the same for both types of boats. The principal or primary problem was to make the large castings at low cost and mold them at room temperature.

The wherry is a workboat, not a lifeboat. It holds eight men with plenty of freeboard. The LCVP holds 36 men fully equipped, or eight tons (jeep or ambulance). The blunt-nosed, 10-ft. beamed LCVP is powered with a Gray marine diesel 220-hp. engine that will push it along at 12 knots.

Because of its slick bottom, it will slide up on the beach farther than a wooden landing craft for a "dry ramp landing" (so the personnel do not get their feet wet). The ramp is ⅜-in. special steel, and there is armor plate three-quarters of the way back along the sides of the boat to shield the personnel from bullets.

Power Plant

A new design development is the separate power pack. The standard wood LCVP is powered by a single engine, mounted on heavy bed secured to the ribs of the boat. For the plastic boat, a steel box with supporting members for the engine, rudder, propeller, keel section and other accessories is bolted into an opening in the hull. If repairs or overhaul are necessary, the entire unit can be removed and a new unit installed. The use of the power pack unit also simplifies the molding of the hull, and makes it possible to store power units and hulls separately.

The Plastic Boat Program at the Puget Sound Naval Shipyard, commanded by Admiral H. E. Haven, has been accomplished through the cooperative efforts of the Production Department under Capt. H. P. Webster and the Planning Department under Capt. H. J. Pfingstag. Cdr. R. C. Lombardi was the Project Officer during development of the 12-ft. wherry. Cdr. C. L. Fears is the present Project Officer.

UNIQUE APPROACH to INDUSTRIAL RESEARCH

Washington State Institute of Technology uses land grant funds to promote industrial development. Full time research staff is aided by college faculty, assuring prompt service on problems.

FAR OUT in the wheat-covered Palouse hills of Eastern Washington has grown an institution that, although remote from most industry in the West, has pioneered a new approach in industrial research.

An explanation of its method of operation and its achievements will be helpful to many Western industrialists seeking answers to their research problems.

This is the Washington State Institute of Technology, a part of the State College of Washington at Pullman. Its purpose is, in addition to academic training in the technical fields of engineering and mining, to conduct research which will enable the State of Washington to realize its full industrial potential.

It can utilize the technical staff of a college faculty to augment its own personnel. It can also undertake research work for private industry on a custom basis.

Among the many "A and M" educational institutions sprinkled around the country, this is one which is really utilizing the "M" as well as the "A" in the "Agricultural and Mechanical Arts" development authorized by the Morrill Act of 1862.

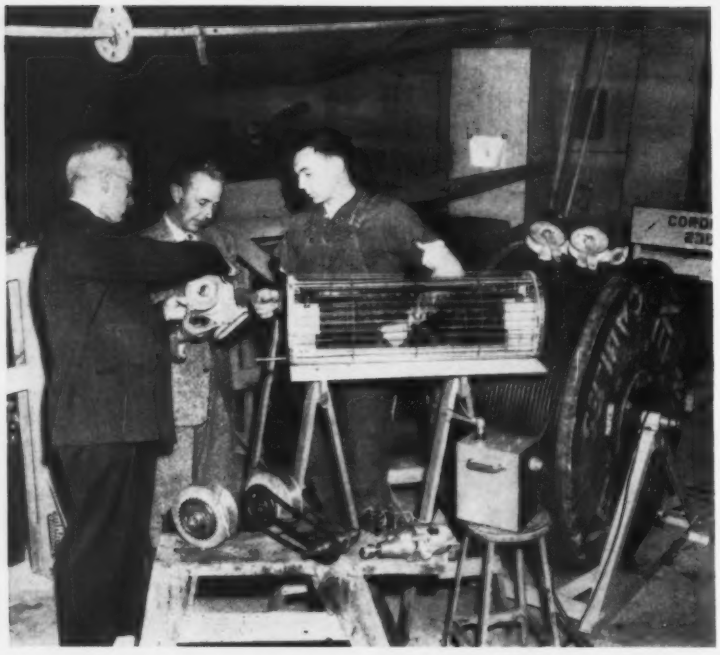
This law provided for federal aid to these two types of educational effort by giving each state a part of the public lands within its boundaries to be sold and the proceeds utilized by the legislature for the purposes specified. Almost without exception, other states have limited the use of land grant money to agricultural research and development.

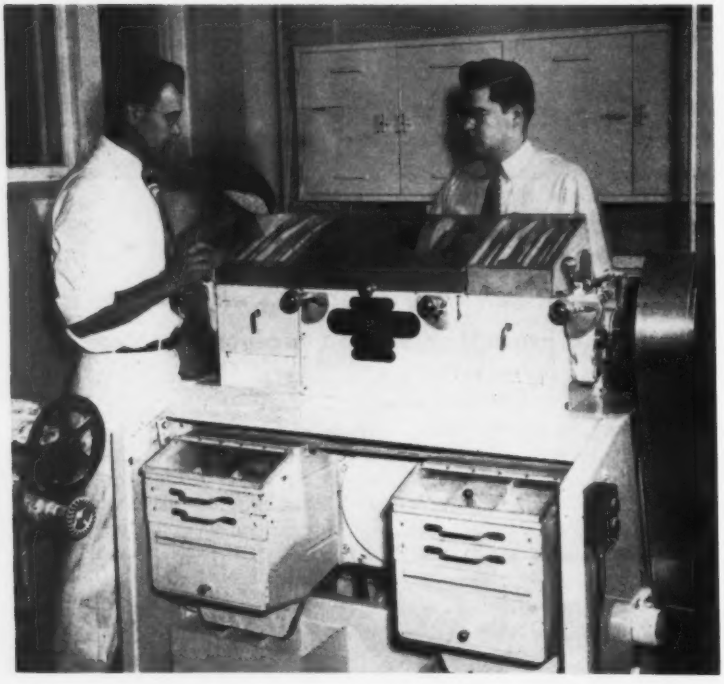
Electricity Spark Plugs It

The need for such a service as the Washington State Institute of Technology now provides has long been realized, but it was first brought to prominence when cheap electric energy became available in the Columbia Basin with its promise of important industrial development. The fact that stockmen, wheat growers, orchardists, and other agricultural producers had benefited greatly from the research carried on in the agricultural experiment stations suggested a parallel opportunity to promote the growth of industry. The absence of any research institutes nearer than 2,000 miles eastward was an added encouragement.

A research project on light metals fabrication initiated by the State College of Washington in 1942 demonstrated the acceptability of such assistance. This encouraged the state legislature in 1945 to provide financial support in the fields of industry and applied sciences at the college.

On the principle that research and teaching should complement each other, the Washington State Institute of Technology was organized in 1946 with four divisions, the College of Engineering, the School of Mines, the





TOP: Developmental model of neon aircraft warning light for long transmission lines demonstrated by Prof. Homer J. Dana (left), director, Engineering Experiment Station. BELOW: Edward F. Seeborg (left), chemist Western Wheat Quality Laboratory, and Norman H. Shoup, engineer, Division of Industrial Research, operating Buhler flour mill with micro-feeder designed by Shoup, built in shops.

Division of Industrial Services and the Division of Industrial Research. The last-named is composed of three groups, the specialized laboratories and sections of the Division, plus the Mining Experiment Station and the Engineering Experiment Station.

Research projects are assigned to individual staff members, but discussion and exchange of ideas among all staff members is encouraged, and the facilities and abilities of all groups may be pooled and brought to bear upon any given problem.

Duplication of effort and equipment are thus minimized, and this kind of operation allows for the fullest use of college equipment and facilities which might otherwise be idle except when required for purely academic demonstration or instruction.

Prompt service on industrial problems is assured by having a staff of full-time research personnel, many of whom have had industrial experience. The technical capacity of the Division is increased by having some of the college teaching staff also on the research staff, either regularly or for summer work.

In this way, the background and training of the teaching faculty can be used advantageously on industrial problems. It also helps to recruit and keep better men in the instructional staff. To relieve this staff of the detail and routine work, undergraduate and graduate students of the college are employed.

Advisory Board Helps

To avoid the criticisms of academic impracticability often encountered by colleges engaged in industrial research, an advisory board from representative industries, such as lumbering, mining, transportation, aircraft, electric power, investment, chemical, and agricultural was established. The advisory board is as follows:

Chairman: L. K. Howe, manager, Westinghouse, Seattle. Vice-chairman: Greek Wells, attorney, Spokane.

F. A. Banks, consultant, Reclamation Bureau. Thomas J. Bannan, president, Western Gear Works. H. W. Beecher, consulting engineer, Seattle. C. V. Brennan, mining engineer, How Sound Company. Henry P. Carstensen, Master, Washington State Grange. Ed Davis, managing director, Assn. of Washington Industries. Charles E. Devlin, general sales manager, Simpson Logging Co.

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This advisory board meets with the entire staff of the Institute of Technology semi-annually, and members are consulted individually or in groups when their particular experience is of value in deciding any given course of action or the value of the work in progress on a project.

The Division of Industrial Research has been aptly described as the "production department" and the Division of Industrial Services as the "sales department." The latter, through field engineers, keeps the research division fully posted on industrial problems, developments, and potentials in the state.

Meetings with chambers of commerce, and technical and professional groups bring together the research men and operating personnel of industry. The latter are often brought to the campus for personal contact and an opportunity to observe the facilities and research operations.

Another function of the Division of Industrial Services is to sponsor short schools and group meetings. A recent example is the Pacific Northwest Industrial Waste Conference held in March 1952.

Research Policies

The policy under which research is conducted for individuals or corporations is governed by the nature of the problem. If the solution is of broad public benefit and any patents or other information may come into the public domain, funds may be drawn from the budget of the Division of Industrial Research. Findings may be published by the Division and patent rights may be retained by the Washington State College Research Foundation.

In the event that benefits accruing from the solution of a problem are narrower in scope, e.g., of interest to a small segment of industry, work is financed on a cooperative basis with the division sharing the cost. The amount underwritten by the division is based upon the breadth of public interest and whether or not findings may be published or what rights may be retained. Charges are based on actual cost for materials and labor plus a ten, fifty, or one hundred per cent burden on salaries and labor for overhead depending upon the initial agreement.

If results remain the sole property of the individual or corporation concerned, then of course the one hundred per cent burden is charged and the results are held to the degree of confidence desired.

An example of the cooperative method is the investigation made to determine causes of breakage in unreinforced concrete irrigation pipe at the request of the Washington State Concrete Products Association. This organization named the amount it felt it could pay for such a study; and, since the results of such investigation would be of statewide benefit, the division bore a part of the cost.

Still another type of project is cooperative between the division and other departments of the college, where an agreement is reached on objectives, procedure, responsibilities, and costs.

The Unifine Flour Bulletin, a study of a grinding process for producing whole-wheat flour, determination of baking and keeping qualities, and commercial acceptability, was the

TOP: Mobile air analysis laboratory, with Donald G. Adams, chemist, operating. BELOW: Professor Homer J. Dana, director, Engineering Experiment Station, with receiving unit used in development of new type facsimile paper.

INSTITUTE ADMINISTRATORS: From left: Dean Royal D. Sloan, College of Engineering; Dean John P. Spielman, School of Mines; Dr. William A. Pearl, Director, Washington State Institute of Technology; Dr. Raymond L. Albrook, Director, Division of Industrial Research; Prof. Eri B. Parker, Director, Division of Industrial Services.

Direct contact with industry is kept up through field offices. Here is R. O. Batdorf of Spokane.

combined effort of the Home Economics Department, the Agricultural Economics Department and the Division of Industrial Research. Other examples of cooperative projects are the hard-end pear tester, dried pear waste feed and the micro-feeder for the Buhler Mill.

All testing and other non-research requests are referred to commercial laboratories which have the proper facilities. As a result commercial laboratories and consultants have found the division of industrial research non-competitive.

TEN TYPICAL PROJECTS SUMMARIZED

Manganese Dioxide

A process for the manufacture of synthetic battery-active manganese dioxide developed at the Mining Experiment Station will be employed in a plant now under construction by the American Metallic Chemicals Corporation. This brings a new industry to the Pacific Northwest as a direct result of industrial research within the Institute of Technology.

Corona Research

Corona discharge from an airplane flying through a storm often completely obliterates all of the radio navigation aids on which the pilot must depend. Many crashes can be blamed on this type of interference. Furthermore, the larger and faster the plane the more severe is this interference. Research is being carried on to determine the relationship between airspeed and the intensity of radio interference.

Aircraft Warning Light

A neon aircraft warning light has been developed cooperatively with the Bonneville Power Administration for use on long spans of transmission lines at river crossings. The light takes its power from the current in the line thus requiring no auxiliary winding. Heretofore it has not been feasible to light such spans except at the towers, and the attendant hazard to aircraft is obvious. Along with the light a portable, remote controlled trolley has been developed which pushes the light into position, clamps it to the line, and returns to the tower for removal without the necessity of a lineman's traveling to mid-span.

Air Pollution Studies

The study of atmospheric pollutants accompanying certain manufacturing processes is a cooperative project being conducted at the request of the Washington Pollution Control Commission. By means of a mobile air analysis laboratory, automatic sampling stations, and fumigation chambers, studies are being made of the possible damage to plants and animals from polluting agents in the atmosphere.

Pipe Corrosion

Corrosion of light metal pipe used in sprinkler irrigation is a problem of growing significance. Its causes have not been fully determined. A continuing study, however, is showing results in the prevention of corrosion, and final solution of the problem will result in considerable savings to agriculturalists in the areas where corrosion is a problem.

Precision Casting

Developments from research in methods of casting metals by the permanent mold process, using resin-bonded hollow cores, have resulted in the production of castings of unusual accuracy. The process is presently being used commercially in the manufacture of thin walled aluminum castings. Castings made by this process require little if any machining, and the resulting saving in the manufacture of certain types of castings is of considerable moment.

Flotation Pilot Plant

Recently constructed in the Mining Experiment Station is a laboratory flotation pilot plant. This apparatus is so designed that it may be used to simulate the operation of full-scale plants, either in operation or projected, and will aid operators in determining circuits or reagents necessary for full-scale operations.

Conductor Vibration Studies

In cooperation with the Bonneville Power Administration, studies of wind induced conductor vibrations are being made with the aim of determining the cause and means of preventing fatigue failures in power transmission lines.

Pipeline-Network Analyzer

The McIlroy Pipeline-Network Analyzer is an important new research tool. The apparatus is used for rapid calculations of flow rates and head losses caused by fluid friction in networks of pipelines or ducts. This analyzer, the first commercially produced of its type, was made especially for the State College of Washington for use by its Division of Industrial Research in analyzing pipeline networks in the Northwest. Professor Charles L. Barker of the civil engineering department and the Division of Industrial Research aided in the design of this model.

Facsimile Paper

Under contract from the Office of Naval Research, a new type paper for facsimile reception has been developed. This paper requires no special packaging and requires no developing process after reception. It is non-sparking and is especially suited for facsimile reception at high altitude aboard aircraft.

BUSINESS IN MOTION

To our Colleagues in American Business . . .

For several years this space has been used to tell how Revere has collaborated with its customers, to mutual benefit. Now we want to talk about the way our customers can help us, again to mutual benefit. The subject is scrap. This is so important that a goodly number of Revere men, salesmen and others, have been assigned to urge customers to ship back to our mills the scrap generated from our mill products, such as sheet and strip, rod and bar, tube, plate, and so on. Probably few people realize it, but the copper and brass industry obtains about 30% of its metal requirements from scrap. In these days when copper is in such short supply, the importance of adequate supplies of scrap is greater than ever. We need scrap, our industry needs scrap, our country needs it promptly.

Scrap comes from many different sources, and in varying amounts. A company making screw-machine products may find that the finished parts weigh only about 50% as much as the original bar or rod. The turnings are valuable, and should be sold back to the mill. Firms who stamp parts out of strip have been materially helped in many cases by the Revere Technical Advisory Service, which delights in working out specifications as to dimensions in order to minimize the weight of trimmings; nevertheless, such manufacturing operations inevitably produce scrap. Revere needs it. Only by obtaining scrap can Revere, along with the other companies in the copper and brass business, do the utmost possible in filling orders. You see, scrap helps us help you.

In seeking copper and brass scrap we cannot appeal to the general public, nor, for that matter, to the small businesses, important though they are, which have only a few hundred pounds or so to dispose of at a time. Scrap in small amounts is taken by dealers, who perform a valuable service in collecting and sorting it, and making it available in large quantities to the mills. Revere, which ships large tonnages of mill products to important manufacturers, seeks from them in return the scrap that is generated, which runs into big figures of segregated or classified scrap, ready to be melted down and processed so that more tons of finished mill products can be provided.

So Revere, in your own interest, urges you to give some extra thought to the matter of scrap. The more you can help us in this respect, the more we can help you. When a Revere salesman calls and inquires about scrap, may we ask you to give him your cooperation? In fact, we would like to say that it would be in your own interest to give special thought at this time to all kinds of scrap. No matter what materials you buy, the chances are that some portions of them, whether trimmings or rejects, do not find their way into your finished products. Let's all see that everything that can be re-used or re-processed is turned back quickly into the appropriate channels and thus returned to our national sources of supply, for the protection of us all.

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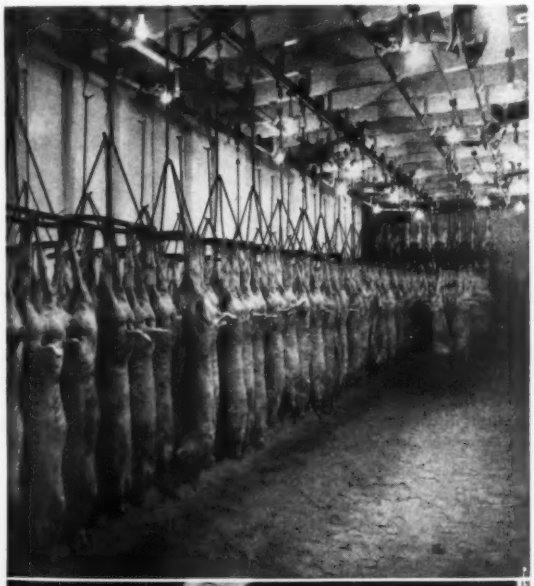
FLUORESCENT LIGHTING PAYS OFF

in meat grading

By GEORGE LEYES

Lighting Appliance Engineer, Westinghouse Electric Corp., San Francisco, Calif.



BEFORE

This lighting system did the job until a new fluorescent installation showed it up as unprofitable.

AFTER

Inspection room is now neater, cooler, lighter, and the meat inspector's job is easier and more accurate.

INCANDESCENT lighting in the meat-grading and selection rooms of the James Allan Packing Company in San Francisco has been replaced by fluorescent lighting. Advantages of this changeover are: (1) average maintained vertical illumination increased from 10 to 18 footcandles; (2) cooling costs decreased; and, (3) meat grading and selecting made easier.

Each room uses 36 vapor-tight luminaires mounted 11 feet above the floor and spaced approximately seven feet apart on staggered centers. They are suspended from chains and cord, with a twist-lock plug-in to conduit.

Location of spurs and hanger racks necessitates the staggered spacing and the flexibility of the cord and plug installation.

Why Fluorescent?

1. Fluorescent lamps provide light with considerably less heat than incandescent lamps of the same wattage. Since they generate two or three times as much light per watt, this results both in an increase in the light level and in a savings in the amount of cooling required.

2. The color of incandescent lamps tends to accentuate the yellow band of the spectrum, which causes the meat fat to have a yellowish cast. Fluorescent lighting, using soft white lamps, gives a better color and more natural appearance, making meat inspection much easier.

Factors Influencing Fixture Selection

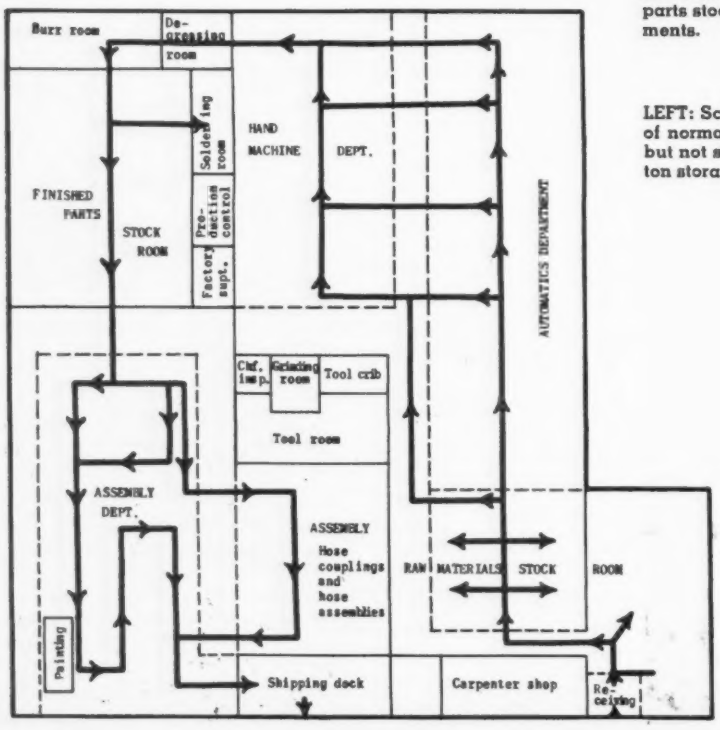
Fluorescent lamps are affected greatly by temperature, humidity, and drafts. The most efficient operation in the meat inspection rooms requires enclosed vapor-tight units so that lamps can operate at about 80 degrees F., free from drafts and moisture. Low temperature may also cause difficulty in starting, unless special lamps and starters are used, although standard lamps and starters will operate satisfactorily down to 30-32 degrees F. in an enclosed unit.

This plant
DOUBLES IN BRASS

Combination machine shop and assembly operation, each one a plant in itself, yet well integrated into a producing unit.

Thirteenth article in Western Industry's plant construction series

JUST ABOVE: Automatic machine dept., where many brass and steel parts are produced at high speed. TOP: Finished parts stock room, between machining and assembly departments.



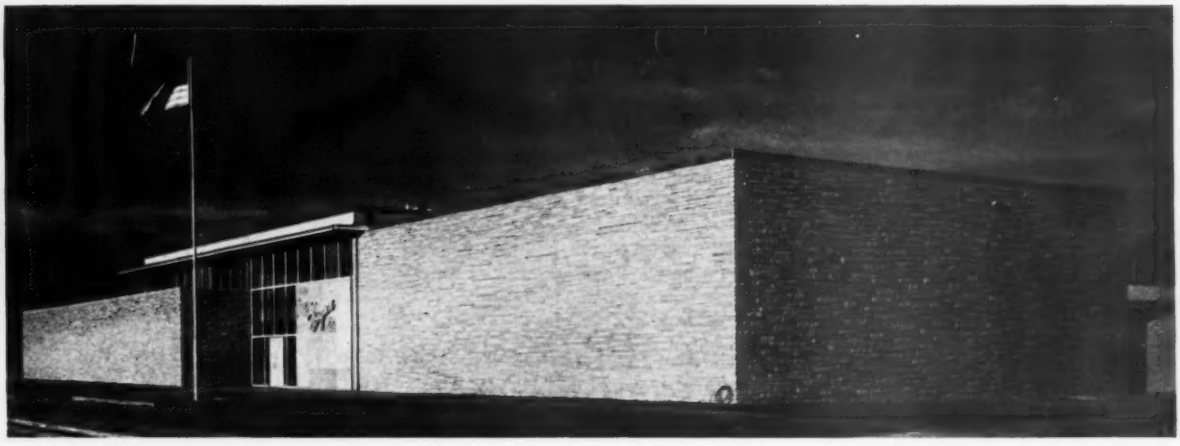
LEFT: Schematic diagram of plant, with lines showing flow of normal production. Mezzanine floor, indicated in article but not shown in drawing, is directly above assembly. Carton storage is located on mezzanine, handy to packing area.

ENGLEWOOD, Colorado, is the site of C. A. Norgren's new plant, which is more than the usual industrial structure; it is laid out in such a way that it might be referred to as two industrial plants—one, a machine shop and the other an assembly plant—each with its own stockroom.

The accompanying schematic drawing of the production area in the new Norgren plant will show the various departments and the flow of production from the receiving department to the shipping dock.

The raw materials stockroom handles such materials as bar stock, forgings, die castings, and sand cast-

LEFT: Water wash spray booth, where products get their finish. RIGHT: Packing benches, showing carton chutes from mezzanine.



Modern design, cooler-on-the-inside, good-looking-on-the-outside, is this brand new Norgren manufacturing plant in Colorado.

ings. Bar material goes to the automatics department and various forgings and castings to the hand machine department for processing.

In some cases, parts will go directly from the automatics department to the degreasing room. In other cases, the parts will go to the hand machine department and then to the degreasing room.

In the finished parts stockroom, where approximately 3,000 different parts are stored, certain parts must be soldered together there before passing into the assembly department. For example, the permanent bowl filter and lubricator bowls must be soldered and pinned to the body of the unit.

Production Flow

The assembly department requisitions parts from the stockroom to meet specific customer orders which are received from the production control department each morning. For instance, if the assembly department should receive a batch of orders in the morning, it would requisition parts from the stockroom to fill those orders only, which are in some cases shipped the same day or within a few days, depending on the size of the orders.

Parts from the finished parts stockroom move in three lines in the assembly department. Filters and lubricators move down the left-hand line shown in the drawing; regulators move down the middle line and join the filter and lubricator line along the way. Hose couplings move in the line at the extreme right over into the hose coupling and assembly division, through this department and back to the shipping department.

Going back to the raw materials stock, bar stock in this warehouse area is handled by means of the monorail equipped with an electric hoist which carries bar materials to the automatic machines. This monorail system runs from the receiving deck through the automatic department.

Carton Chute

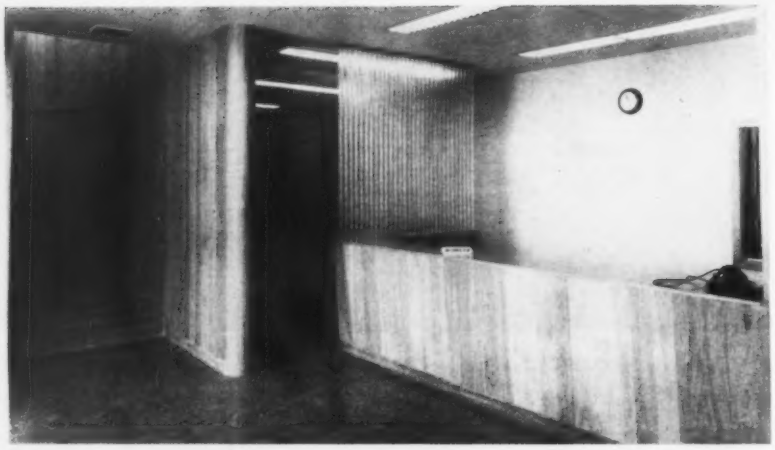
Flat cartons are stored and made up on the mezzanine. Most of the pneumatic products are sent out in shipping cartons. These cartons are stored and made up in this mezzanine area and fed to the packing benches by means of a 30-ft. long inclined carton chute.

This chute puts cartons in various sizes directly before the packers at head height, and the sizes of boxes fed down to the packing benches in rows are graduated from the smaller sizes at the left-hand end of the chute to the largest sizes which are at the far right end of the chute. This is to provide small boxes for packing individual units and larger boxes at the right for packing quantities of individually packed units.

20% Production Hike

With present equipment and manpower, it is expected that this new plant will achieve a 20 per cent increase in production capacity. Within the present walls of the new plant Norgren officials estimate that they have the space to provide for a 50 per cent increase in production capacity for future expansion.

Some idea as to the production speeds reached in the automatic department is seen in the fact that they produce some hose coupling ferrules at the rate of 600 parts per hour on



MAIN LOBBY, showing wood paneled stairway to upper lobby, entrance to sales offices, and reception desk. This area is every bit as architecturally refreshing as the general building design itself.

multiple-spindle machines, and other parts are produced on single-spindle machines at a rate up to 1,200 parts per hour.

Inspection of parts is made by the operator at the machine and by roving inspection department men throughout production. In the assembly department, an area is devoted to special inspection whereby every lubricator and filter is given a hydrostatic test for leaks and every pressure regulator is given a performance test before shipment.

BUILDING FEATURES . . .

The building covers approximately 50,000 sq. ft. of the site and was so planned that a future expansion of 20,000 sq. ft. can be made with comfort. Portions of the building are two stories in height. The floor area is distributed as follows:

	Sq. Ft.
Administration Unit	22,000
Basement and boiler room	1,700
Main floor	15,000
Second floor	5,300
Plant Unit	40,450
Main floor	34,150
Mezzanine	6,300

Total floor area is 62,450 sq. ft.

The administration unit contains reception rooms and lobby, executive offices, advertising and sales departments, conference and board rooms, personnel offices, engineering and drafting rooms, engineering laboratory, first aid room, kitchen and lunchroom. The latter will serve also as an auditorium which will seat 500 people.

STRUCTURAL POINTS

Structural characteristics of the building involve a structural steel frame, masonry walls, and light weight concrete roof and floor construction. Exposed cinder block walls were used in the plant unit and the walls of the administration unit are cavity-type masonry composed of cinder block and Lyon's flagstone.

INSIDE FINISH

Interior finishes in the administration unit involve plaster and acoustical tile on the ceilings and plaster on the walls. The reception lobby is vertical oak planking. Floor coverings are terrazzo in the reception area and asphalt tile elsewhere.

MECHANICAL EQUIPMENT

Mechanical features in the plant unit are extensive due to manufacturing requirements and including piping systems for high- and low-pressure steam, high- and low-pressure air and gas, all in addition to the usual water and drainage systems. A fire sprinkling system was also included.

HEATING AND VENTILATING

Heating of the plant is by unit heaters with exhaust fans for summer ventilation. The administration unit has both ceiling and floor radiant heat with complete air conditioning, which can also be used for winter ventilation.

ELECTRICAL AND LIGHTING SYSTEMS

Electrical work involves busduct heaters, plug-in ducts extending from overhead cubicles and trolley-duct grids over the length and breadth of the plant unit, permitting quick, safe and economical changes in power equipment and lighting facilities.

Protective lighting is controlled with centralized low-voltage switching systems, while the magnetic contractor control is used for the balance of the flood lighting.

COMMUNICATION SYSTEM

A coded call system is utilized for paging personnel and a complete interplant and outside dial telephone system fulfills all communication needs.

Under-floor duct system for signal and power circuits in the office areas provide maximum utilization of office space. Planned lighting provides from 40 foot candles in office and plant areas to 80 to 100 foot candles in the drafting, tool and grind rooms. Lighting and small power systems are derived from dry-type transformer installations throughout the plant.

WESTWARD LOOK

The entire glazing on the west (view) side of the building is heat-absorbing glass. The exterior walls of the administration unit are red Lyon's flagstone. A tile-floored roof terrace opens off the second floor on the view side.

Who Did It

Architect ..... Stanley E. Morse
Designer ..... Jared B. Morse
Structural Engineer ..... Milo S. Ketchum
Mechanical Engineer ..... K. J. Murray
Electrical Engineer ..... A. D. Swanson
General Contractor ..... F. J. Kirchhof Construc. Co.

Subcontractors and Material Suppliers:

Burkhardt Steel Co. ..... *Structural Steel*
Colorado Metal Products ..... *Steel Sash*
Colorado Builders Supply Co. ..... *Steel Joist*
Cleveland Tramrail Denver Co. ..... *Monorail Hoist*
Lauren Burt, Inc. ..... *Cello-Tex, Acoustical Tile*
American Flooring Co. ..... *Asphalt Tile*
Murray Sales Co., Rapid Standard Co. ..... *Conveyors*
Bradbury Bros. Equipment Co., Star Sprinkler Corp. ..... *Fire Sprinkler System*

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Take the SHAKES out of your machines

Balance them
Tighten loose parts
Replace worn items
Soften the impact

By
E. A. LUSCH
President
A. B. Boyd Co.
San Francisco
Calif.

"IF IT MOVES, salute it. If it doesn't move, paint it." That was the theme of many military men in the last war. Today, many of those same men are now in industry, and their theme has changed to "If it wiggles or vibrates, stop that machine before it walks away or shakes the building apart."

Machines *do* walk, you know, if they are slightly unbalanced and not secured to the floor. And they *do* shake buildings apart if proper measures are not taken to prevent it. Insurance companies have numerous cases on file to testify to both points.

Couldn't Happen to Me

"But," you plead, "this couldn't happen to me. Why, that little punch press has been going like that—clicking off 500 parts a minute—for a good long time now. No trouble yet—and I don't see any cracks in the building."

Maybe so—but have you taken a good look at your employees lately—the ones who work around the machine? Vibration has a strange way of seriously affecting employees' health. Insurance case records will bear this point out, too. Better not take any chances—play it safe with all concerned, and prevent any damage—to building or personnel—by taking proven measures to correct the situation before you have to.

Two Basic Forms

Vibration is present in two basic forms: one, sound frequency, and two, mechanical impact. High frequency vibration is known as noise, and is treated by acoustic engineers. Low frequency vibration is more of a thumping, and treated by vibration engineers. Both these kinds of vibration play upon nerves—from the high-pitched supersonic whistle that affects dogs' ears (animals react to higher vibration frequencies than humans can detect) to the slow, methodical Chinese gong torture, which shatters the air as well as the ear in its performance.

This article has to do with treatment of vibration only—low frequency mechanical vibration, as it relates to shop machinery. An accompanying article treats the problem of high-frequency vibration from the standpoint of acoustics and sound control.

In your plant do you have . . .

Product rejects
Inaccuracies
Accidents
Absenteeism
Employee inefficiency
Employee distraction
Employee fatigue?

If you do, the following two articles are designed for you. All of these things cost you money. All of these things are caused by vibration and noise, and proper control of either or both can go a long way toward eliminating the cause of your problems.

The First Steps

First steps to be taken toward reducing machine vibration are perhaps the most obvious ones: balance the machine, where you can. Remove or eliminate loose connections that cause the trouble.

This cannot always be done, since some machines are designed to be unbalanced, or to operate in an eccentric fashion. However, first replace worn parts and see that loose parts are tightened.

Then the problem comes down to isolating the remaining vibration by reducing the transmission of vibrational energy that passes from the machine to its foundation.

A large number of products are offered to accomplish this purpose, ranging from gadgets to felt. Proper felt isolation will decrease vibration and noise that would ordinarily be transmitted through the base of the machine and subsequently to other parts of your building.

At times, no great reduction of airborne noise is apparent, even after isolation, but considerable improvement in noise level conditions or vibra-

tion may be noticed in other parts of your building.

Use of Felt

Felt is an engineering material, standardized in all its many types, and its applications are capable of mathematical analysis. Four different types of felt are employed for vibration isolation.

Vibration isolation of machinery can be done by inserting the most suitable felt under supporting legs of the machine, or under the base, between the machine and its foundation in a prescribed manner.

Efficient isolation is best achieved by the use of relatively small pads under each leg of the machine or at each corner of a flat bed, rather than by the indiscriminate use of felt sheets under the entire machine. While an optimum of felt is desirable, a maximum should be avoided.

To prevent sidewise movement or "walking," there are five simple and effective designs:

1. Short studs may be used, which protrude part way into the felt from top to bottom.
2. Felt washers may be used to isolate lag screws from the machine.
3. The felt may be glued with suitable adhesives, obtainable from your vibration engineer or felt supplier.
4. Retaining cups may be attached to both machine and foundation, the cups being shallow enough to prevent contact with each other.
5. Special pads designed for the purpose may be obtained from your felt supplier.

Principles upon which vibration from machinery is dampened by felt are simple. When vibration reaches felt, it does work upon it, and much of the energy is converted or absorbed. Some of it appears as friction between the closely-interlaced fibers of the material, and some of it is taken up by working against the natural resilience of those fibers.

In addition, felt permits the machine a moderate amount of motion relative to its support, so that the vibratory forces can be countered in part by the natural restoring forces within the machine.

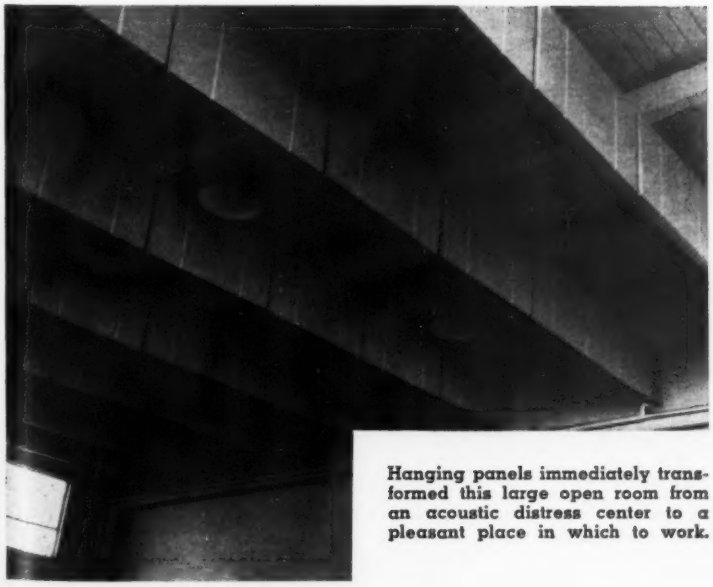
Avoid Conduction

In designing applications of felt for vibration absorption or isolation, it is important to avoid conduction through bolts or other anchors between machine and floor or foundation.

In general, the greatest isolation effect is had by using small areas of special vibration isolation felt at recommended optimum loadings. Thicknesses usually are from ½ in. to 1½ in. Felt mountings are available which can be loaded up to 100 lb. per sq. in.

Take the RACKET out of your business

It clouds judgment, lowers precision, causes fatigue, reduces your work output



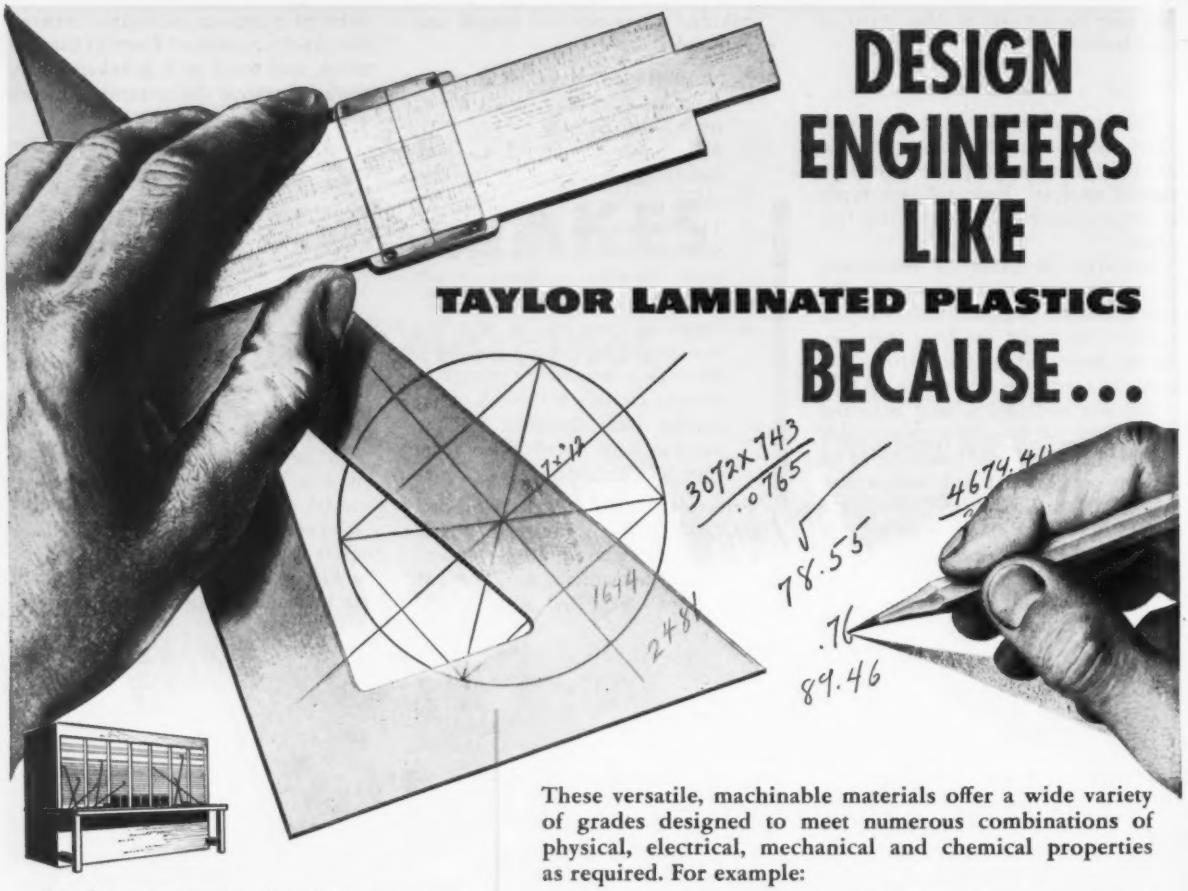
Hanging panels immediately transformed this large open room from an acoustic distress center to a pleasant place in which to work.

IF IT IS A PLEASANT sensation to your eardrums, you probably call it "sound." If it is an unpleasant sensation, you more probably call it "noise." While some types of sound may be beneficial, practically any type of noise is detrimental, and that is the subject of this article.

What Noise Does

Here, for example, is what noise—undesirable sound—can do to you or your employees: It can interfere very seriously with the efficiency of your workers. It exacts a great toll upon the general nervous systems of mental workers. It clouds judgment, reduces precision of your actions, contributes to fatigue and lowers work output. It impairs your hearing and produces emotional disturbances and neuroses.

Noise, without a doubt, is one of the industrial liabilities to be slated for early control if you want a productive



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plant operation. But noise, or more correctly sound (an all-inclusive term), is peculiar stuff and needs corrective measures peculiar unto itself.

Ears Won't Adjust

Unfortunately, nature has provided no built-in mechanism so that your ears can automatically adjust themselves to varying intensities, or loudness, of sound. Your eyes can adjust themselves to varying degrees of lightness or darkness, but not so with your ears. So, soft or loud, the sound enters your ears and impinges against your eardrums in all its force.

Two basic means of sound control are at your disposal: (1) equip each employee with ear-stuffing of some sort, or (2) harness and tame the objectionable sound itself.

In a boiler factory, perhaps the ear-stuffing method is appropriate—but in any more normally-noisy factory or office, efficient sound control by acoustical engineers is more in order. They know how to do it and can prescribe the proper materials for optimum results.

For your information, here is some background information about sound and how it can be controlled to your best advantage.

Confined Sound

Starting at the sound source, be it a typewriter or drop forge, this is what happens: A sound is generated, and it spreads in all directions. If it is uninterrupted it goes out into the air and is dissipated after it travels to exhaustion—much the same as a pebble dropped into a pool of water creates a water wave that is dissipated after it travels to exhaustion.

On the other hand, if sound is enclosed inside a building or room, a different set of circumstances results. That sound is transmitted in two ways —one, through the air, and the other, through structural members of the building. Confined uncontrolled sound will reverberate from wall to wall, wall to ceiling to floor, and so on, with the resulting illusion to a worker that the sound is louder than it actually is, and with a false sense as to the point of sound origination.

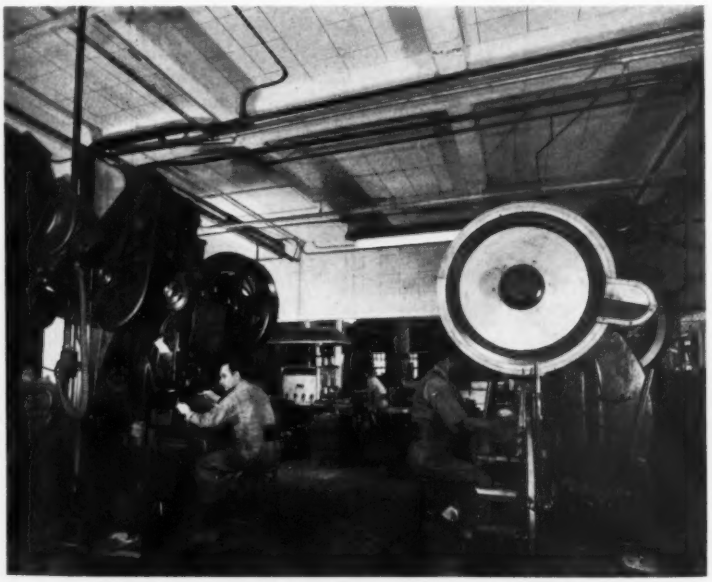
That same sound, uncontrolled, will go through walls, ceilings, floors, to other rooms and areas and cause considerable confusion to the workers there. Solid structural members of a building, incidentally, are excellent sound conductors. Sound comes out the other side of the wall or ceiling with comparatively little loss of intensity, unless the wall or ceiling has been provided with some means to dampen or eliminate that action.

No Standard Prescription

There is no standard prescription for curing your sound problem. No two plants are designed alike, nor do they have the same sound intensities generated in the same spots. Hence, before starting a program of sound control for your plant or office, it is most advisable to consult an acoustical engineer or a supplier of acoustical products. Conversely, it is quite foolish not to do just that.

Qualified acoustical engineers are equipped with both the necessary testing and measuring equipment to identify the type and intensity and frequency noises that may constitute your problem—and these engineers have the experience and ability to treat your plant or office as an individual problem and come up with an optimum solution.

All sound is produced by mechanical vibration. The faster the vibration frequency, the higher the pitch of the sound. Best common example of this is a fire or police siren. It starts out so slowly that you can count separate impulses. Then, as the siren revolves faster, and sends out more impulses



Ceiling and beam treatment in this room full of presses went a long way toward maintaining good spirits and interest by employees in their work.

Here is an effective use of acoustical materials, treating both ceilings and walls. Generated noise is thus confined to the immediate area concerned.

of mechanical vibration, the pitch rises in frequency and penetrating power.

Transmitted sound is best controlled by insulating the sound generating means from the sound conductors. The accompanying article on vibration treated part of this phase.

Transmitted sound is best eliminated by forethought and preparedness.

Structurally, in order to prevent sound transmission from room to room or from floor to floor, walls, ceilings and floors of particular design are required. This must be incorporated in the original building design, or it necessitates a complete renovation of the walls, ceilings, and floors. Acoustical engineers are the ones to diagnose your problems and prescribe a scientific treatment within the bounds of your own economy.

Particularly noisy machines are probably best treated by isolating them in a separate room, insulating them from transmission members, and then treating the walls and ceilings acoustically.

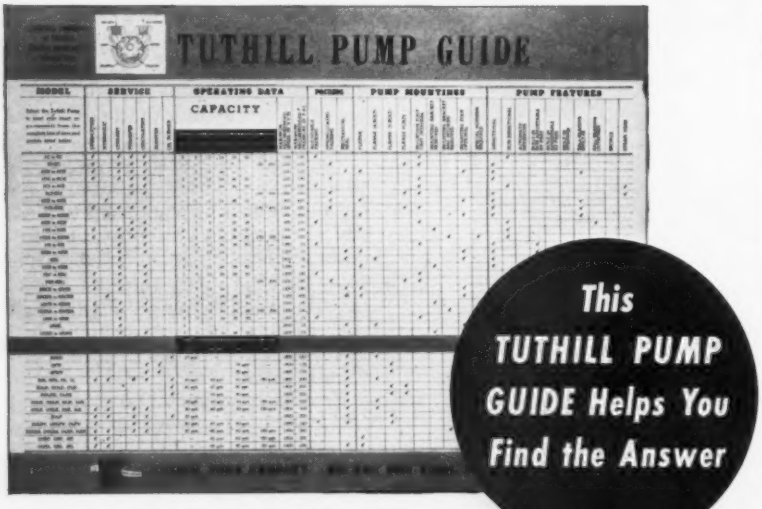
An important point should be brought up here: in order to do a complete job of sound control by isolation, you must account for 100 per cent of the room enclosure area. A small thing like a crack under the door, or even an open keyhole, will allow an amazing amount of sound to filter from one room to another.

Air borne, reflected sound is probably best controlled by installation in the room or building of sound-dampening devices. These are of five general types: (1) interior wall and ceiling plasters, (2) interior wall and ceiling boards, (3) acoustical tiles, (4) blankets of prefabricated sound-absorptive material that are installed inside the wall structure, and (5) hanging panels.

Suppliers of acoustical materials or acoustical engineers are best equipped to recommend the particular type of material for your needs.

Sound elimination within a given room can never be done completely, since the sound origin itself is still there giving off sounds into the air. However, by properly engineered acoustical control, you should be able to rid your plant or office of a great amount of objectionable noise, and improve employee health, morale and production. Sound "conditioning" is just as important to you as air conditioning, heating, or ventilating your plant or office.

NEW EASY WAY TO SELECT THE RIGHT PUMP FOR THE JOB



This TUTHILL PUMP GUIDE Helps You Find the Answer

To save you time and trouble in selecting the pump best suited to your application, Tuthill engineers have developed this revolutionary new Pump Guide. Here, in one easy-to-use chart, is a volume-full of information on the complete line of Tuthill Pumps.

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At a glance, it shows you the services for which each model is built, together with performance characteristics, types of packing, mounting styles and distinctive features that enable you to fit the pump to your need, rather than the need to the pump.

Copies of this helpful guide are now available on request. Write for yours today—there's no obligation.

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GENIUS REWARDED AT WESTINGHOUSE

ADDITIONAL REWARDS to inventors are now offered by Westinghouse Electric Corp. Patent Disclosure Committees in various company divisions will administer the new patent award policy.

To be known as "the most meritorious disclosure award," the new plan calls for each committee to select the "most meritorious" patent disclosure from every 50 received. Final say will rest with the division manager whose approval will give the inventor $200. If two inventors are involved in the disclosure, each will receive $150.

All disclosures received in the company's patent department after January 1, 1952 are eligible for award. This latest plan means that the company offers four different prizes ranging from $25 to $5,000, the latter for exceptional disclosures that prove to have extraordinary commercial value.

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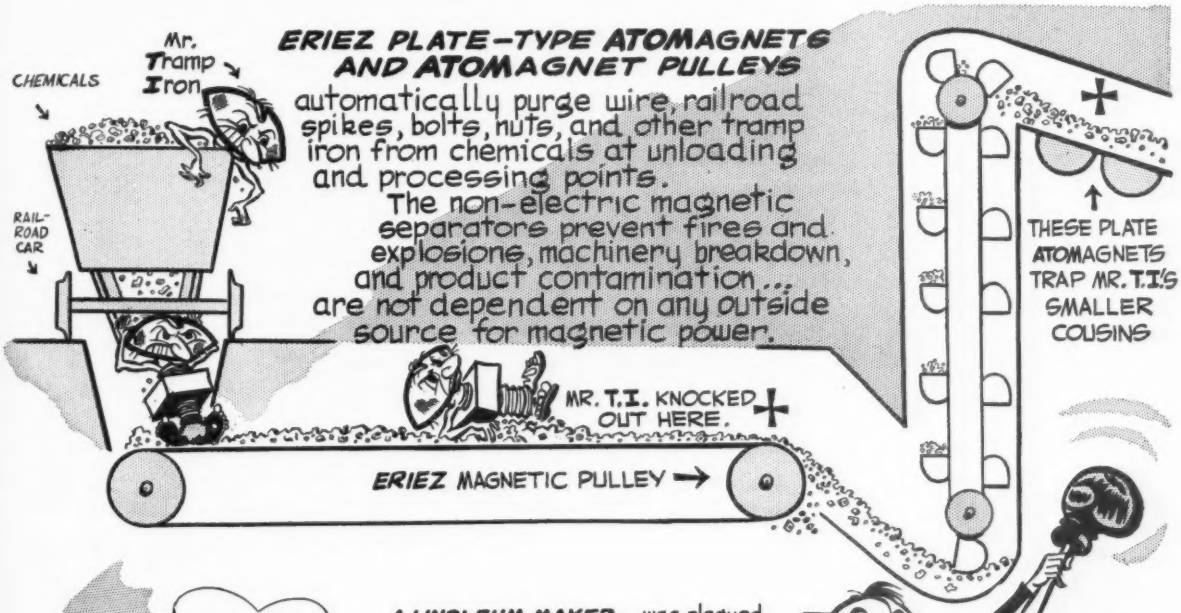

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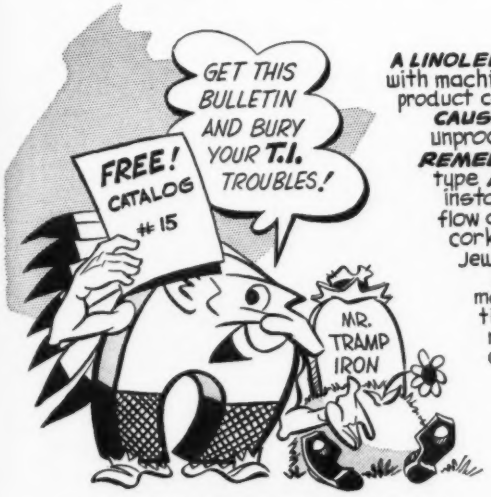
automatically purge wire, railroad spikes, bolts, nuts, and other tramp iron from chemicals at unloading and processing points.

The non-electric magnetic separators prevent fires and explosions, machinery breakdown, and product contamination... are not dependent on any outside source for magnetic power.



A LINOLEUM MAKER... was plagued with machinery damage, fires and product contamination.

CAUSE: Tramp Iron in unprocessed cork...

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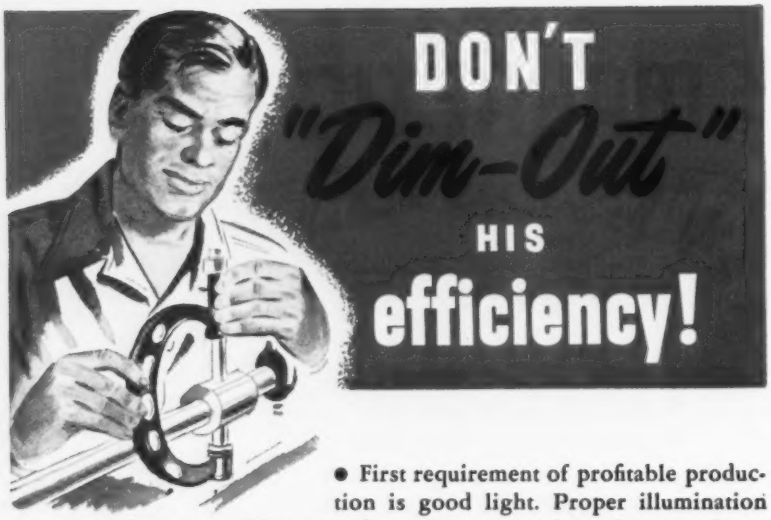

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Each Appleton Lighting Fixture is precision-designed to provide *good light*—the right light, without uncomfortable glare, troublesome contrast or shadow.

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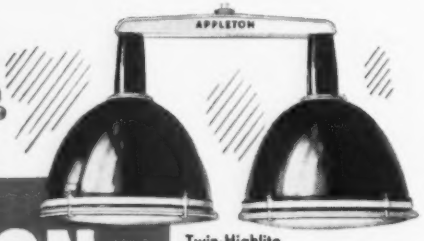

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Field Engineers in All Principal Markets

NEW ELECTRONICS USES—

Opportunities in agriculture, lumber, paper and manufacturing outlined in survey by California State Chamber of Commerce

IF YOUR PRODUCTS (from abacuses to zymometers) have any perceptible physical variations upon which the product quality depends (such as color, size, weight, power, density, etc.), a little thing like a radio tube can go a long way toward solving your problem of maintaining a constant product quality.

Accurate Measurement

Control is based upon measure, and in order to control accurately, you must first measure accurately. That is one of the most important functions of an electronic tube, in the present-day industrial field.

However, it is not the a-to-z use of electronic tubes by any means. Many other uses of high industrial value are presented in a booklet just issued by the Research Department of the California State Chamber of Commerce, titled "An Examination of California's Electronics Industry."

Industry Mushrooms

New Western uses of electronic tubes have increased so far to the point that employment in California's electronic industry has risen from less than 4,000 only a very few years ago to a present total of better than 36,000. This indicates a continuing era of expansion in the field of electronics in the West.

A questionnaire sent to all California electronic manufacturers revealed that this state's abundance of skilled labor, its availability of land and its favorable climate were the controlling factors in locating in California. Engineering "know-how" was said to be the principal resource of this mushrooming industry.

Use Survey Made

By way of determining possible uses for electronic tubes, electrical engineers at the University of California, Berkeley, were asked to suggest where electronic equipment might be applied to some of California's industries. Here are some of the engineers' observations:

In agriculture:

1. Grading of all fruits and other produce in packing plants. This is already in use.
2. Equipment for killing pests within the ground and on trees by high power microwave radiation is under study.
3. Fruit peeling will be done electronically.
4. Electronic equipment will speed the slow prune and apricot drying process.

5. Wine can be graded by use of supersonics to measure its sedimentation.
6. A new device is being created to crack walnuts by an electric spark.
7. Fruit and vegetable picking equipment is already in the experimental stage.
8. Electronic equipment for the purification of dairy farms will be available.

In lumber and paper:

1. High frequency dielectric heating of lumber and plywood is planned. This would conserve timber resources as most warped lumber could be treated and restored to proper condition and shape.
2. The thickness of paper could be determined by electronically counting its absorption rate.
3. Printing could be speeded by electrostatically charging the sheets in a manner in which the ink would adhere only to those sections so charged. (Now under development.)

In manufacturing:

1. High frequency power equipment is being developed for metal hardening and welding for automobile assembly plants.
2. Explosive rivets may be detonated by electronic devices.
3. Mass produced dielectric heating equipment may become available for the quick preparation of fresh frozen foods.
4. Thermoplastic materials can be sewed by electronically generated heat.
5. Homes and factories will have their air sterilized by electronic equipment.

In mining:

1. New advances in Geiger counters and nuclear instrumentation will be available.
2. Geologic surveys will be made easier by sinking a shaft to analyze the material in the earth electronically.
3. Equipment will be readied for the detection of gas in mines.

These are but a few of the applications to which electronic devices will be put.

Other Possibilities

Glen McDaniel, president, Radio-Television Manufacturers' Association, San Francisco, has noted the contracts for electronic equipment are constantly being diffused among a multifarious number of industries. This suggests, he said, "that electronics may be a necessary part of any business of manufacturing mechanical apparatus, and that in the end it will be difficult to define the electronics industry."

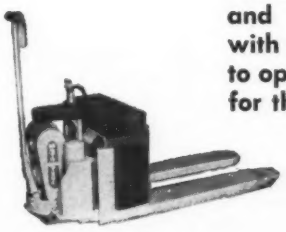
Of course, the largest potential area of growth in the electronics industry (outside of its military applications) lies in its application to consumer products. The list above and other notes and comments in this paper would indicate that there is practically no limit to the industry.

While many of the items already indicated may take years to develop commercially, there will be a constant flow of new applications ready to take their place in the experimental laboratories.

MOTO-TRUC'S MODEL PAL

- Reduces Costs
- Saves Man Hours
- Speeds Production

Model PAL Pallet

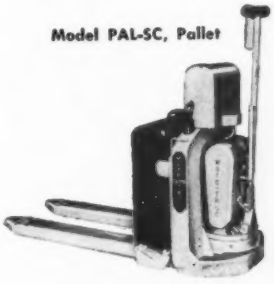


Break those Production Bottlenecks and reduce handling manpower with Moto-Truc's efficient and simple to operate "Walkies". They soon pay for themselves in savings to you.

Whether its a problem of warehousing, production "Flow" or "Inprocess" inventory; one or more of Moto-Truc's 6 Basic Models is quickly adaptable to your specific needs. Their short turning radius and added power make them the most efficient in the "Walkie" field.

A "twist of the wrist" does it.

Model PAL-SC, Pallet



The above photo shows one of Moto-Truc's Model PALS in a large eastern warehouse. They now do the work of many hands, adding 1/3 more storage space and speed up "in and out" traffic. In Pallets, Platform or Hi-lift types, Moto-Trucs cover the field for efficiency, rugged, all-welded construction and ease of operation.

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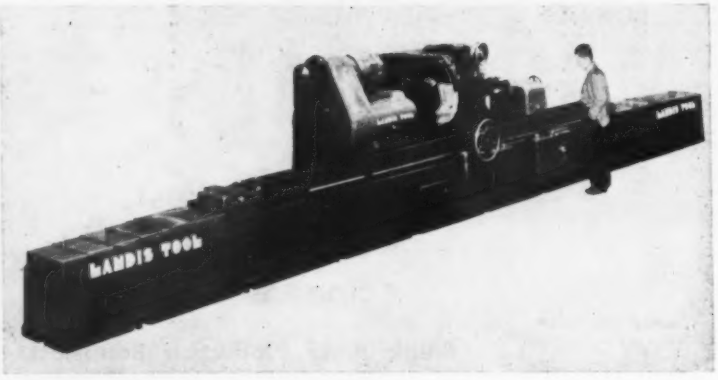
NEW WESTERN FACILITIES FOR...

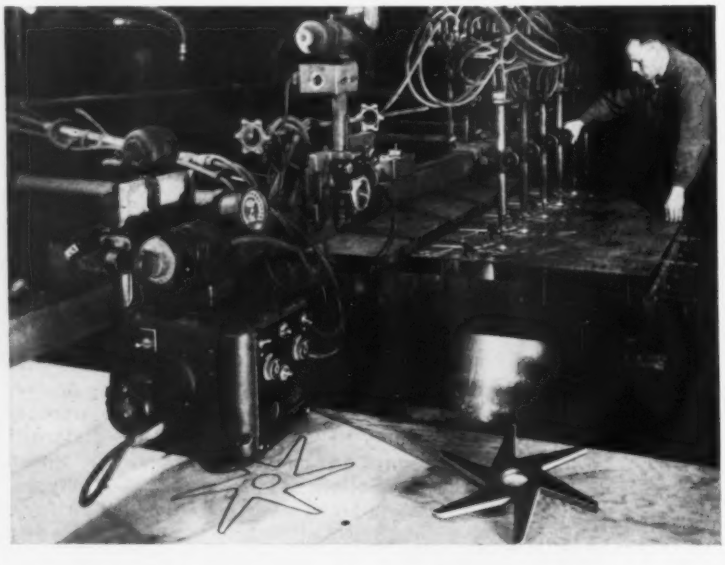
...finer finishes on hydraulic roll grinder



A NEW Landis type FR hydraulic roll grinder with 24-in. swing and 192 in. between centers has just been installed at Moore Dry Dock Co., Oakland, Calif. This machine has the ability to produce finer finishes and closer tolerances through a number of new and fundamental design features.

Moore engineers, with years of training and experiment in the shaft and roll grinding and corrugating field are available to discuss any problem concerning the roll requirements or repairs in Western plants.

...faster flame cutting of intricate shapes



GUIDED BY A PHOTO-ELECTRIC TUBE, heart of this machine, mechanized flame cutters now provide industries in the Seattle area with the newest and fastest method of producing intricate shapes from steel plate.

Now in operation at the Seattle plant of Joseph T. Ryerson & Son, Inc., the electronic tracer operates from the simplest of all templates, a black and white outline drawing or a cut-out or inked silhouette. The "eye" follows the drawing or outline and any pattern can be reproduced faithfully in steel with squarer, sharper corners than can be cut with other types of mechanized flame cutters.

Styrofoam control surfaces developed by Northrop

PROCESS ENGINEERS at Northrop Aircraft, Inc., have developed a successful method for using Styrofoam, a hard plastic foam, as an inner filler for control surfaces. The method eliminates the need for ribs and, by overall adhesion, eliminates the necessity for 80% of the rivets now used in control surfaces.

Styrofoam, produced by expanding polystyrene approximately 40 times into a snow-like multicellular foam, has been considered by engineers for some time in view of its savings in weight and ability to eliminate vibration by filling voids within control surfaces. Higher speeds are made possible by elimination of vibration.

A metal plastic adhesive was developed by engineers for bonding Styrofoam to sheet metal. The adhesive, which provides an exceptionally high-strength bond, can be brushed on small surfaces and sprayed on larger areas.

Use of Styrofoam as a substitute for ribs makes possible control surfaces as much as 15% larger in size, with decreases in weight up to 10% and increases in strength up to 10%. In test stages, a control surface designed for stress loads of 150% underwent stress loads exceeding 300%, and when engineers, in another test, attempted to stress a surface to the point of destruction, they were unable to, since the hinge attaching the surface to the test stand snapped under the strain.

Scale model points up mill machinery advances

THE MAN who "has to be shown" can certainly have his wish when he visits Mater Machine Works in Corvallis, Ore. The firm has constructed a working model of a sawmill, completely accurate to ¼ scale, to demonstrate advances in sawmill machinery in the past ten years.

This is not an inanimate model. It will saw small logs and cants. The carriage is an exact replica of a Mater "Riderless" Carriage, with air dogs and a remote control setworks. Just as in the actual machine, sawing, setting, dogging and other operations on the carriage are controlled by the sawyer by means of push buttons.

The Mater model also demonstrates modern deck equipment, where lumber can be turned by carriage flipper and deck pusher arrangement without use of a nigger or hook arrangement.

Logging and sawmill conventions as well as distributors will have the model on display in the future.

DIESELS and air-conditioned cars require larger force of electricians. Apprentice in battery shop is shown learning how to use the hydrometer. Apprentices trained individually.

SANTA FE'S TRAINING

Dieselizing required training men familiar with operating new engines to become shop supervisors. Apprentice schools will serve future needs.

SANTA FE's dieselization program, now more than a decade old, has provided an opportunity for adapting to new conditions and equipment a training program that dates clear back to 1884, in the days when the railroad reached from Kansas City to San Diego, but had not gotten around to including Chicago, Los Angeles, San Francisco or Galveston.

APPRENTICE BOARD composed of all supervisors and apprentice instructors meets each month with assistant superintendents to discuss each apprentice's progress in detail. First six months of apprenticeship is a probationary period.

No Simple Job

Dieselizing a railroad is not merely buying new locomotives and revamping existing manufacturing and maintenance facilities. Training supervisory personnel and the apprentices from whom future supervisory talent will be drawn is a companion job of equal importance, because of the specialized knowledge required in repairing, building and manufacturing the various parts of a diesel-electric locomotive.

When the Santa Fe embarked on its dieselization program a decade ago, its service facilities included the shops in San Bernardino, where steam locomotives had been overhauled for half a century. But for supervision of the new type of work, men had to be found who were familiar with diesels. Consequently the natural place to turn was to the men who had training in actual operation of the new locomotives in service on the road.

First these men were brought back to the operating terminals where the locomotives receive so-called "running repair" and servicing. From these positions they later moved in to the San Bernardino shop, where extensive and complete rebuilding of all parts of diesel-electric locomotives is carried on, and they now hold positions as supervisors of all work.

Many of the former foremen used on heavy steam locomotive work were absorbed into the organization by

placing them in charge of groups that handle a certain class of repairs continuously.

Education was necessary for three classes of men: (1) those with road training who needed further instruction; (2) foremen who had not had general training on diesel power; (3) mechanics, electricians and other mechanical crafts. In order to take care of the three groups, an instruction car was built and equipped with a complete locomotive set of electrical equipment, controls, etc., arranged so operation of all the parts was visible. This enabled the instructor to cover the functioning of each part.

Instruction Car Useful

Equipment of the instruction car included a full-size section of a diesel engine, operated by an electric motor, a complete steam generator, air compressors and governors. Motion picture apparatus for showing details was also provided. As changes and improvements in the locomotives were made, the instruction car was also kept up to date.

Instruction classes for supervisors are divided into two sections, one for mechanical aspects of the locomotive, the other for electrical features. All supervision is required to attend and complete the classes for both the electricians and the mechanics.

Specialized Classes

In addition to this instruction car, which is used throughout the Santa Fe System, specialized instruction classes are organized and conducted in the San Bernardino shop by competent instructors covering particular subjects such as roller bearings, inspection of materials by electric induction, and other processes. Many classes are conducted by the supervisors themselves that pertain to their particular department; such as fuel injection system testing and repairs.

Generally, the supervisors are selected from graduate apprentices who have completed the required training for an apprentice on the Santa Fe System. Courses of instruction for the apprentices have been gradually revised as the transition from steam power to diesel power was developed, and the courses for the various crafts such as electrician, mechanic, boilermaker, sheetmetal worker and so forth, now cover the complete diesel-electric locomotive.

Choosing Apprentices

Apprentices for the courses in the various crafts are selected from high school graduates for what is termed a "Regular Apprenticeship." This course covers a four-year period, during which they receive a specialized training in school work.

Class rooms, instructors, instruction books, drafting instruments, paper, and so forth are furnished free of charge and these young men are paid for attending school. Their compensation is increased at the completion of each six months period of their training.

Progress Is Checked

The amount of training and education that the individual apprentice receives during his term of school is predicated upon his ability to absorb the technical data that is available, and very exacting minimum requirements are in force.

The first six months period for the apprentice is classed as a probationary period, during which the school instructor can determine whether or not the young man is adaptable to continuing this type of work. Each month, a group of foremen who have been selected as an "Apprentice Board" conduct a meeting with the apprentice instructor and render a detailed report covering each apprentice, going over the progress that the young man has made, as well as bringing out any weaknesses that may have developed, for consideration in giving special handling in each case.

During the course of the apprentice training program, the young man will work in the shop on all types of equipment and all types of machinery; moving from one assignment to another on a regular schedule, working for each group supervisor, and his accomplishments on the various types of work are recorded.

In this manner he has an opportunity to learn fully in detail all phases of the work, and in some crafts will travel on the road with maintenance gangs that have to do with road repair. The complete apprentice course is scheduled upon a certain number of days to complete each assignment.

Training for Supervisors

At the completion of the apprentice's course, a very thorough knowledge of the qualifications and ability of the young man has been developed, and from these graduate apprentices can be selected suitable prospects for further training for supervisory positions. These men can, after they have completed the course, be placed in road operation as "Assistant Supervisors of Diesel Locomotives" for operational training, and later can be moved back into the maintenance terminals or shops as supervisors over respective groups.

For College Graduates

For college graduates who have a degree in Mechanical or Electrical Engineering, a "Special Apprenticeship" is available, which consists of a three-year term covering generally the work that the regular apprentice must do, excepting the regular school course. After their graduation, they may enter the Test Department, or follow the line of promotion as mentioned above for the regular apprentices.

Here is H. V. Gill (seated), superintendent of the shops at San Bernardino, talking training problems over with the three men who are the instructors in the apprentice schools. Standing, from left: G. O. Graefe, locomotives; W. Benge, electrical; and A. S. Brooks, car building and repairs.

Built to outlast...out West!

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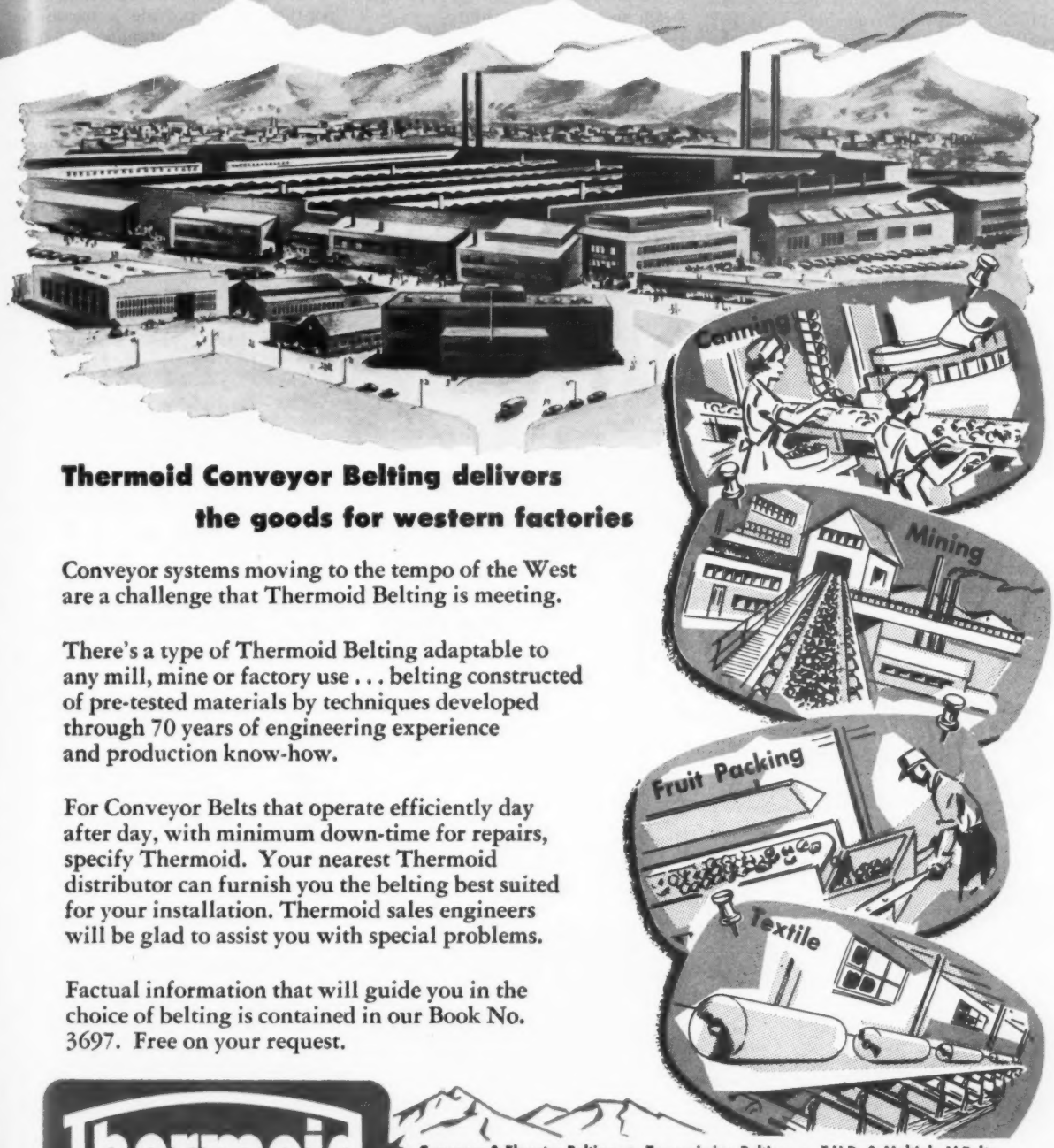
Quality Value Service



Thermoid Conveyor Belting delivers the goods for western factories

Conveyor systems moving to the tempo of the West are a challenge that Thermoid Belting is meeting.

There's a type of Thermoid Belting adaptable to any mill, mine or factory use . . . belting constructed of pre-tested materials by techniques developed through 70 years of engineering experience and production know-how.

For Conveyor Belts that operate efficiently day after day, with minimum down-time for repairs, specify Thermoid. Your nearest Thermoid distributor can furnish you the belting best suited for your installation. Thermoid sales engineers will be glad to assist you with special problems.

Factual information that will guide you in the choice of belting is contained in our Book No. 3697. Free on your request.

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Offices and Factories: Trenton, N. J. Nephi, Utah;

SMOG: No easy answer in sight

Air pollution conference finds much work lies ahead

OUT OF THE AIR pollution conference in Pasadena last month emerged the grimy fact that there is no easy, obvious solution to the smog problem, and that from here on in it will have to be a slow process, with one correction after another being applied.

The American Petroleum Institute has decided to put the question of appropriating $250,000 for further research on smog up to its board of directors.

A second technical report has been made by the Los Angeles County Air Pollution Control District which said that current experiments show that gasoline vapors and certain other hydro-carbons can be oxidized in the air to produce crop damage, eye irritation and reduced visibility.

Other points in the report may be summarized as follows:

The oxidation of the hydrocarbons in the polluted air mass is explained by a build-up of the ozone and the peroxides that are produced through photochemical and oxidation reactions of contaminants in the atmosphere. The smoke-like haze and irritating gases created by the low-temperature oxidation in the air may be considered as the end products of "cold combustion."

The findings open a new field of investigation to provide a means for reducing these contaminants. It is necessary to develop more precise procedures for evaluating the sources. Preliminary studies discussed in this report indicate that vapor losses from processing and storage of gasoline at refineries and the exhaust of automobiles account for the major portion of hydrocarbons found in the atmosphere.

Control of known pollutants has continued, except for the smoke from the burning of rubbish at homes and small business establishments. Smoke going into the air has been reduced only 31 per cent since the District began functioning in April 1948, while dust, fumes and liquid particles have been reduced 46 per cent and sulfur dioxide 50 per cent.

During the fiscal year, control devices costing $2,737,300 were installed by industry and tested and approved by District engineers. This brought the total cost of control devices put into operation since the District's program began in April 1948 to $6,661,900. Basic equipment installed during the year and designed to meet District standards for preventing pollution of the air was valued at $36,123,000 and brought that total to $50,923,300. Cost of the District's operation during the year was $461,867.08.

Industrial Impact of a Four-Ounce Tin Can

A LITTLE THING like an ordinary tin can doesn't look like much, but the economic repercussions of manufacturing them is something of note.

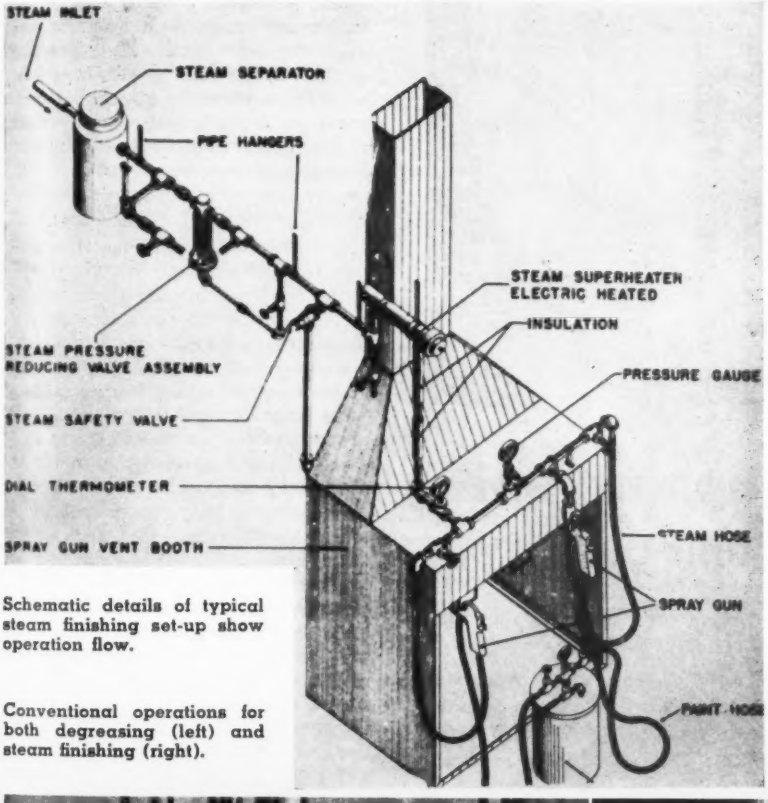
For example, according to C. W. Roberts, Pacific Coast vice president of American Can Co. (who operates eight plants in California), "tributary businesses involved in the 2,400,000,000 cans made for fruits and vegetables in California last year handled the following amounts of materials:

Manufacturers bought from other businesses, both large and small, 320,000 tons of tinplate for the can bodies; 1,800,000 pounds of solder to seal the side seams; 826,000 pounds of compound to seal on the ends; 3,000,000 pounds of enamel to line the containers; 1,670,000 pounds of paper; and 1,240,000 pounds of glue for the labels.

STEAM SPRAYING:

A finishing course for production shops

Thermostat of a superheater is regulated preparatory to steam finishing operations at the Clayton Manufacturing Co., El Monte.



Schematic details of typical steam finishing set-up show operation flow.

STEAM SPRAYING is an unusually efficient finishing process. It consists of using steam pressure instead of pneumatic pressure to apply synthetic enamels and other organic coating materials to numerous metallic and non-metallic surfaces.

This is said to minimize material losses due to atomization and overspray while making it possible to apply many finishing compounds without pinholes, sags, and related defects.

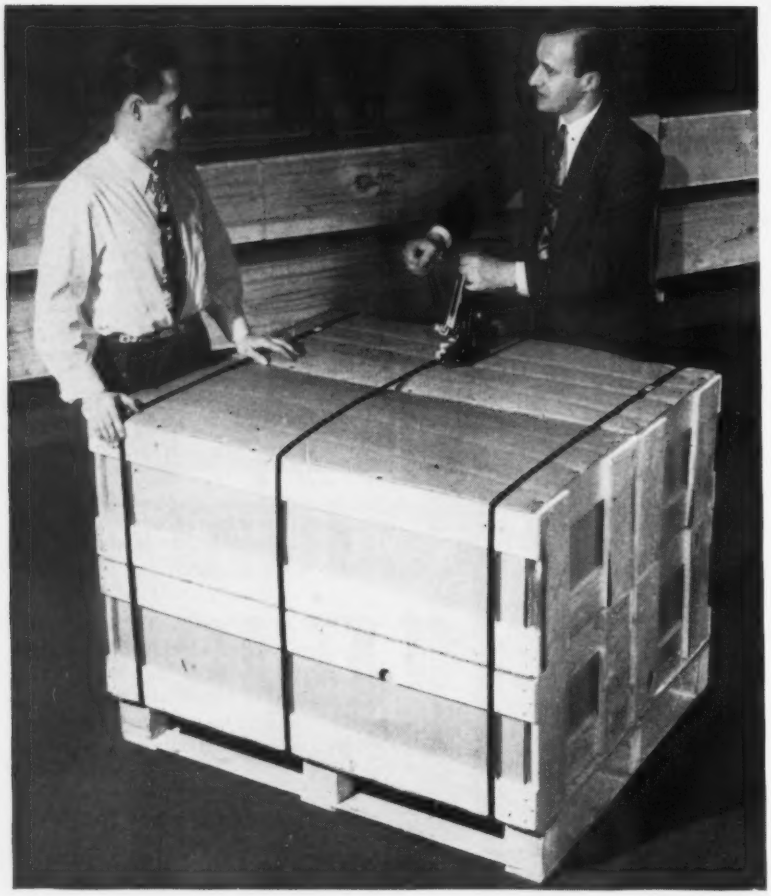
Weber Showcase and Fixture Company of Los Angeles, and Clayton Manufacturing Company at El Monte, California, now use the process.

Economical to Use

Steam is an economical source of heat and pressure for organic finishing operations, since it can be obtained from boilers of the types that are already available in many factories.

All but about 1% of the moisture in the steam emerging from a boiler is removed by passing the steam through

Conventional operations for both degreasing (left) and steam finishing (right).



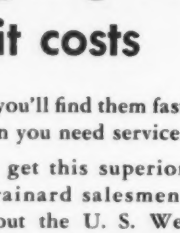
Demonstrates **strapping unit loads** to cut unit costs

LIKE other Brainard Strapping System salesmen, Paul Frank of St. Louis *sells with service.*

Here Paul demonstrates the proper use of Brainard steel strapping and strapping tools to secure four separate crates into a unit pallet pack. Such palletized loads expedite materials handling before shipment, in transit, and at the receiving end.

Use the experience of Paul Frank and his fellow Brainard salesmen. They are qualified to study your packaging and handling operations, then recommend *and demonstrate* the most efficient strapping system for you. And . . . you'll find them fast on their feet when you need service.

You'll get this superior service from Brainard salesmen located throughout the U. S. West Coast Office: 717 Market Street, San Francisco. Phone: Yukon 2-4667.



COMPLETE STEEL STRAPPING SERVICE, LIGHT AND HEAVY DUTY STRAPPING, TOOLS AND ACCESSORIES

For new catalog on Brainard Strapping System write Brainard Steel Division, Dept. Q-6, 717 Market Street, San Francisco, Cal.

Brainard
STEEL DIVISION
SHARON STEEL CORPORATION

WARREN, OHIO

a separator, after which the temperature of the steam is greatly increased by means of a small "superheater."

Standard reducing valves govern the input and output pressures of the steam as it is superheated and piped to a tank containing the coating solution. Then finishing operations are accomplished with a manual gun in a booth, much the same as finishing operations are accomplished with pneumatic spray equipment.

Materials applied with steam-spray equipment have to date been thermosetting resin composites (such as the alkyd, phenolic, and urea enamels which solidify as the result of exothermal chemical reactions).

Thermoplastics (such as the lacquers and shellacs which solidify as the result of solvent evaporation) might be steam sprayed, but there is room to doubt whether this would be practical in view of the fact that very small quantities of moisture can cause thermoplastic coatings to "blush" or become defective.

Eliminates Solvents

In thermosetting coatings, the small quantities of moisture in superheated steam tend to eliminate the need for solvents or thinners which are essential to the use of pneumatic spray finishing equipment; and the temperatures of materials emerging from a steam-spray gun are such that virtually all of the moisture in the steam is dispersed in the atmosphere before it can reach a deposition surface.

Little or no heat is conveyed by a steam-spray coating to a deposition surface, due to the cooling action of open air, but the use of heat in applying a thermosetting material tends to accelerate the chemical reaction which will solidify the coating—thus reducing the need for special heating or baking equipment.

Delays Obviated

Rapid solidification of sprayed thermosets in turn enables finishers to apply relatively thick coatings without the delays or defects that could otherwise be anticipated.

No Western manufacturers are yet known to have combined steam-spray and electrostatic finishing facilities. However, a patent application recently filed by E. I. du Pont de Nemours, Inc., indicates that this would be practical. Electrostatic finishing consists briefly of allowing the output of a spray gun to pass through a high-voltage field, so that the sprayed particles will be electrostatically charged and electromagnetically attracted to the surfaces of conveyor-grounded products.

Boilers now used to provide pressure for finishing purposes have maximum capacities of 50 lbs. per hour for each spray gun. One of the best of these is a product of Clayton Manufacturing Co. Initially developed to facilitate the steam cleaning of automobiles, it produces steam containing less than 2% moisture.

Many different superheaters, separators, pressure valves, gauges, etc., are economically available for steam-finishing purposes from manufacturers and suppliers of conventional heating equipment throughout the country.

Special spray guns are essential to the application of coatings with steam pressure, since the heat of superheated steam would make it impossible for a worker wearing the heaviest gloves to use a conventional pneumatic gun for such work. However, steam-spray and pneumatic-spray guns can be distinguished only to the extent that the former have insulated handles which may be purchased or made to order. Manufacturers of special guns for steam-spray purposes at this writing include DeVilbiss Company of Toledo, Ohio, and Kellogg Division of American Brake Shoe Company.

Safety and Upkeep

Where adequate equipment is available, the hazards of steam finishing are comparatively slight. Workers have suffered burns due to carelessness and fatigue; but, in view of the fact that steam spray coatings minimize the need for volatile solvents or thinners, the possibility of injuries resulting from actual fires or the inhalation of toxic vapors has been measurably reduced.

Nozzles of steam spray guns have a tendency to become clogged from solidification of coating materials that collect and build up in the orifice. This can usually be avoided by increasing operational pressures over a period of six to eight hours; but, where the use of high steam pressures is not practical, it is a simple matter to make use of a replacement nozzle while soaking a clogged nozzle in a caustic stripper solution.

Coatings applied with steam-spray equipment are not necessarily better than the same materials applied with other types of equipment. However, steam spraying does make it possible to apply coatings that are most likely to be free from defects at a comparatively low cost.

Reduced costs are attributable to material savings amounting to as much as 20%, fewer rejections due to applicational deficiencies, lower expenditures for power, and a better ratio of productivity.

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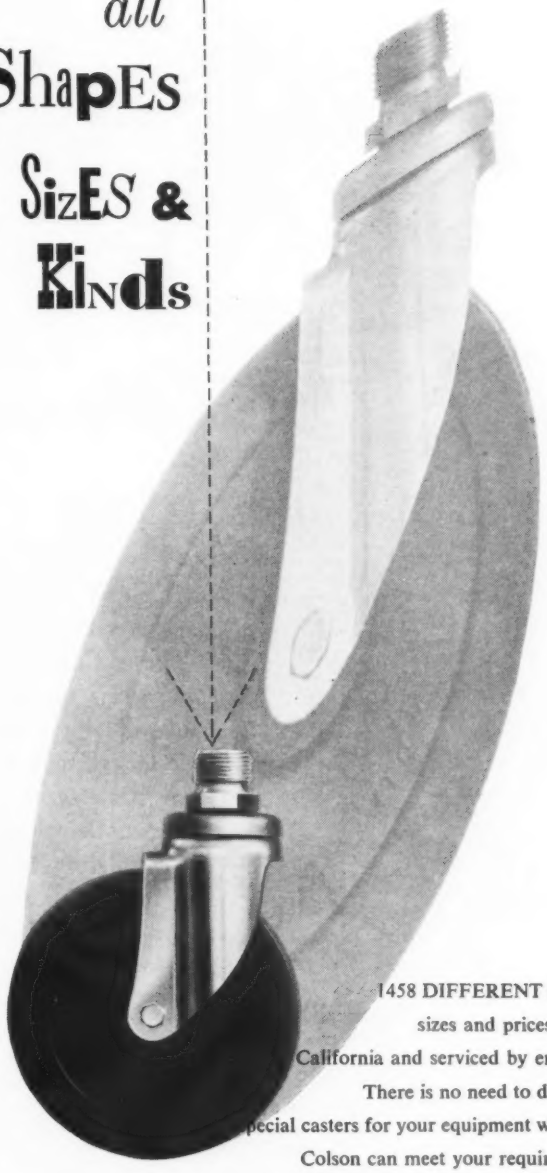

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Who Pays the Freight on Aircraft Parts?

"EXTORTIONATE" rates for shipments of airplane parts on the nation's railroads are being paid by the aircraft industry, the Government, and the American taxpayer, according to a brief filed recently before the Interstate Commerce Commission by the Aircraft Industries Association.

Railroads earn 94% more per car mile on aircraft parts shipments than they average in the U. S. as a whole for all freight traffic, the Association contended in a case against principal U S. railroads, filed in an effort to obtain lower freight rates on plane builders and government shipments.

Ninety-five per cent of the planes produced in the nation's aircraft plants are for the military. "This fact is particularly significant," insisted Harry R. Brashear, Director of AIA's Traffic division, "because the burden of paying these incredibly high freight rates is ultimately passed along to the American taxpayer, who is underwriting the nation's defense buildup."

The Government, the Military Services, and the aircraft industry are charged an average of twice as much per car-day on aircraft shipments as is the average U. S. shipper, according to AIA.

Railroads, in justifying doubled freight rates for aircraft parts shipments, contend that the parts have greater value and are more bulky than normal shipments.

"One-Piece" PIPE

THALER PIPE AND SUPPLY COMPANY offers this, the first threadless malleable fitting, to western industry. It is just another leader carried by Thaler to provide you with a complete piping service.

Here is a threadless pipe fitting that gives you the strength and tightness of a "one-piece" piping system. The Flagg-Flow malleable iron fitting—for brazing to standard black steel or wrought iron pipe. No loss of strength in threading—no expensive welding. Suitable for all radiant heating and systems subject to vibration.

THALER pipe & supply company

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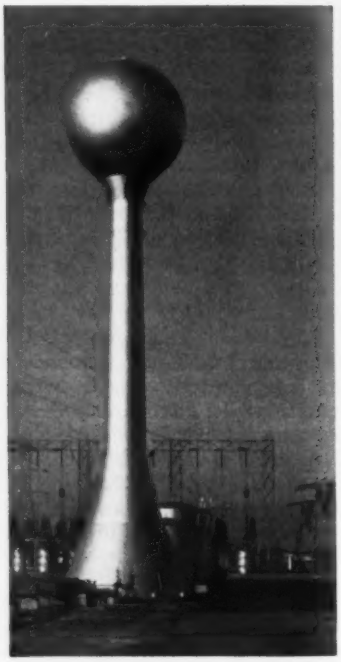
Pipes, Valves and Fittings for all Industrial Uses

Getting Around the Water Supply Problem

THAT BALL contains 25,000 gallons of water. It is known as a "Watersphere," just erected at the Center substation for Southern California Edison Co., about 20 mi. southeast of Los Angeles.



Nothing but water in this highball.

It was designed (1) to provide a gravity type system that would assure (2) an adequate supply of water for fire protection and (3) sufficient water for normal uses for at least two days in case of supply failure.

Designed in accord with AWWA specifications and the L. A. building code, it will withstand a 10% g. seismic loading. The ball is 19 ft., 4 in. in dia., the base is 22 ft. in dia., and height from the ground to base of the ball is 70 ft.

Water supply is obtained from a 12-in., 75 gpm. well equipped with a 5-hp. deep well turbine pump. Operation of the pump is controlled by level of water in the tank.

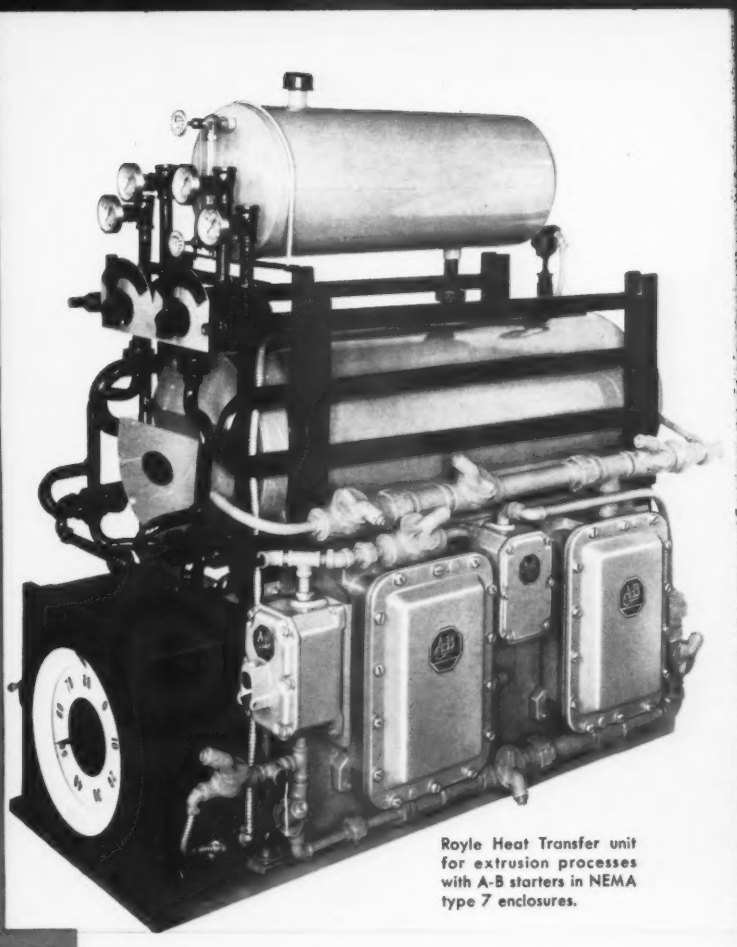
Normal water requirements at this substation are 10,000 gpd.

Where BOLTED ENCLOSURES are a MUST...

Specify

A-B Quality

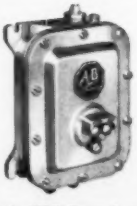
TROUBLE FREE STARTERS



Royle Heat Transfer unit for extrusion processes with A-B starters in NEMA type 7 enclosures.

NO CONTACT MAINTENANCE

Bulletin 609 manual starter in NEMA type 7 enclosure for hazardous gas locations.



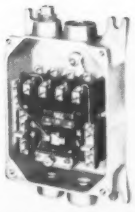
Bulletin 709 Form 1 magnetic starter in NEMA type 7 enclosure for hazardous gas locations.

Freedom from contact maintenance is, of course, desirable in any motor starter . . . but especially so for controls in safety enclosures with bolted covers.

It is never easy to unbolt and replace heavy cast iron covers for routine inspections. That is why electricians and plant engineers specify Allen-Bradley trouble free motor controls. They know from experience that Allen-Bradley switches with double break, silver alloy contacts will operate for months . . . and even years . . . without requiring even contact inspection. They know also that the simplicity of Allen-Bradley starters means freedom from trouble . . . hence, freedom from production stoppages.

When you have a location requiring bolted safety enclosures, do away with maintenance trouble by specifying Allen-Bradley trouble free controls. When you have an especially tough job, always use A-B controls. Why not send for the Allen-Bradley Handy Catalog and have full information at your finger tips?

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.



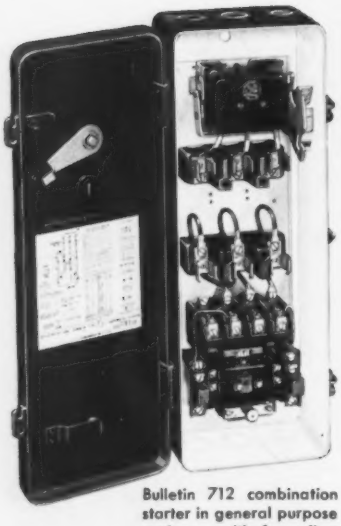
Bulletin 709 magnetic starter with cover removed. Enclosure is NEMA type 4 for watertight operation.

ALLEN-BRADLEY

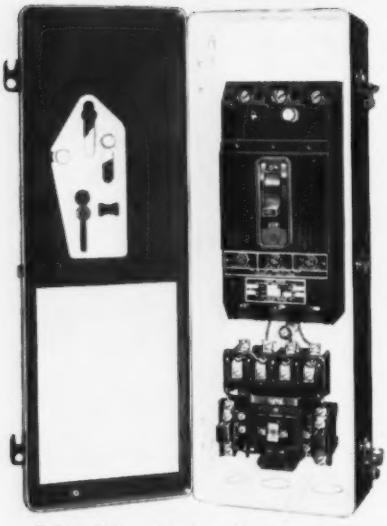
MANUAL AND AUTOMATIC STARTERS

QUALITY

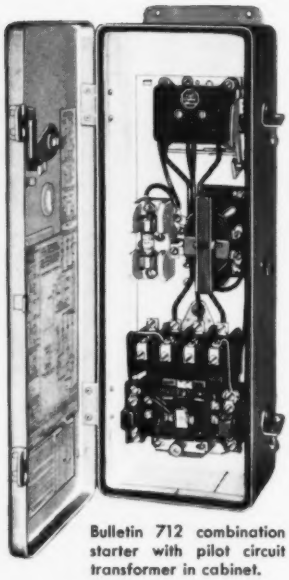
3-52-M



Bulletin 712 combination starter in general purpose enclosure with fuse clips.



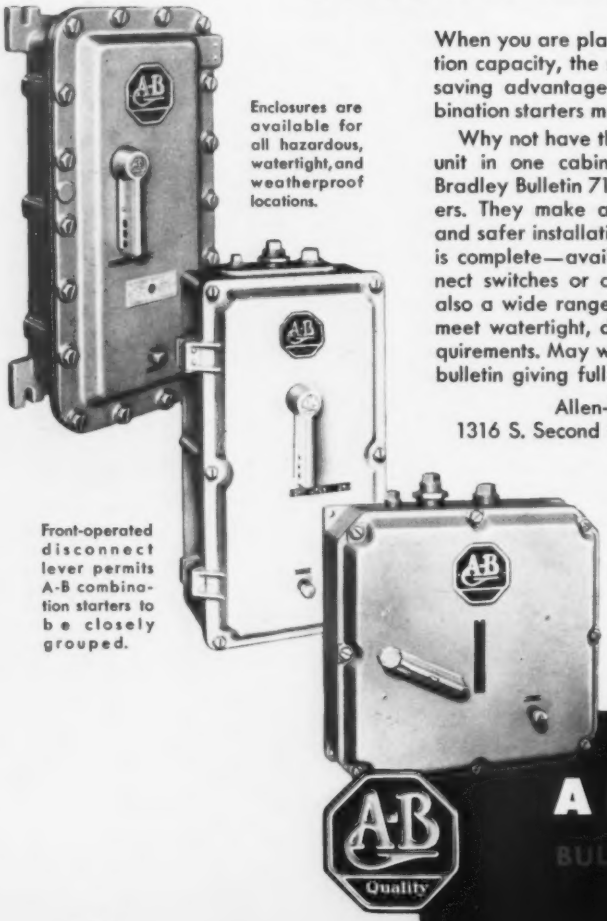
Bulletin 713 combination starter in general purpose enclosure equipped with ITE circuit breaker instead of fused disconnect switch.



Bulletin 712 combination starter with pilot circuit transformer in cabinet.

A GREAT LINE • A COMPLETE LINE

of Combination Starters



Enclosures are available for all hazardous, watertight, and weatherproof locations.

Front-operated disconnect lever permits A-B combination starters to be closely grouped.

When you are planning additional production capacity, the space-saving and labor-saving advantages of Allen-Bradley combination starters merit serious consideration.

Why not have the starter and disconnect unit in one cabinet? Just specify Allen-Bradley Bulletin 712-713 combination starters. They make a neater, more compact, and safer installation. Bulletin 712-713 line is complete—available either with disconnect switches or circuit breakers. There is also a wide range of special enclosures to meet watertight, dust-tight, or gastight requirements. May we send you a descriptive bulletin giving full details and prices?

Allen-Bradley Co.
1316 S. Second St., Milwaukee 4, Wis.

Bulletin 712 combination starter in dust-tight enclosure.

Allen-Bradley starters in safety enclosures require no contact maintenance—a great convenience with bolted enclosures.

The disconnect lever can be padlocked up to 3 locks to prevent accidental switching during machine maintenance.

A-B Quality

ALLEN-BRADLEY

BULLETIN 712-713 COMBINATION STARTERS

QUALITY

3-52-M

Increase noted in Bay Area industrial land sales

SURVEY of three San Francisco Bay Area counties reveals that first quarter sales of industrial lands totaled 522 acres—compared to 230 acres in the first quarter and 461 acres in the fourth quarter of 1951.

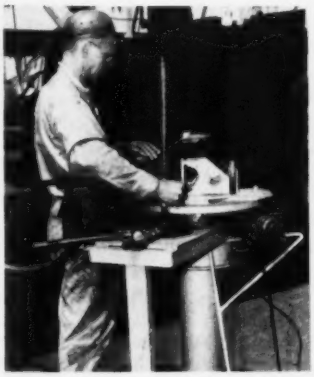
Speaking in dollars and cents, Robert P. Danielson, San Francisco industrial planning consultant stated that in Alameda, San Francisco and San Mateo counties, this year's dollar volume totaled $1,597,027, compared to $1,316,359 in the first quarter and $2,214,187 in the fourth quarter of 1951.

A change in location of sales was noted by Danielson, with Alameda County falling behind San Mateo County this quarter in both acreage sold and dollar volume.

Turning tube turns to a good use

HERE IS A PICTURE of that famous Western asset, "know-how."

Harvey T. Dennis, a welder at General Petroleum Corporation's Torrance, Calif., refinery just hated to see good tube turns thrown on the scrap heap when the tubes to which they were attached wore out. But it cost too much to detach them by hand for re-use.



So he designed this mechanical device also made from materials in the scrap heap, which speeds up the operation sufficiently to make it worthwhile. Result: a saving of scarce steel capacity right back to the ore mines.

The idea won Dennis a $225 award under General Petroleum's suggestion plan.

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AMERICAN Makes It

● Whether you need welded or weldless chain, or attachments . . . small chain or large . . . for use in your plant or as part of your product . . . choose from the AMERICAN line. This illustration gives you some idea of the variety of patterns and sizes.

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American Chain

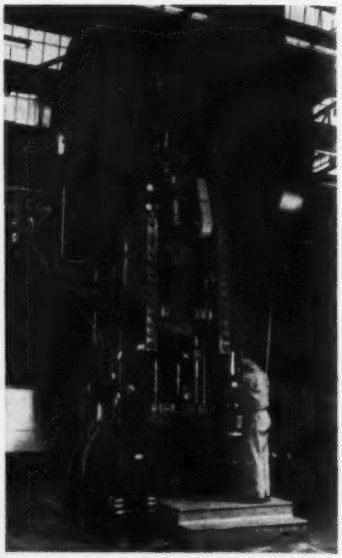
FABRICATION PROCESS

saves weight and saves metal

MANUFACTURE of some sorts of tubular-shaped products took a hefty but pleasant shock this year when Lockheed engineers came up with their method of impact extrusion.

G. W. Papen, production engineer, indicates that extrusions by this process open entire new fields of parts design, and that some desirable shapes previously prohibitive in cost are now practical.

Thinner-walled parts can be produced now, resulting in vital weight-saving for aircraft manufacture, particularly. Some parts can be made with only a quarter of the metal bulk formerly required. Many parts ordinarily made by boring or drilling can now be made by impact extrusion without any waste of metal.



HERE IT IS — Lockheed's 1,000-ton Bliss extrusion press for forming tough metals.

Impact extrusion process is not new to the metal-working field, as applied to soft metals. Making the process work with new metals now in use by aircraft manufacturers (some of these metals are six times as tough as those formerly worked) is something else again. Lockheed is the first aircraft firm to assign a research team to the problem, and to report the findings.

Economies Up to 75%

Primary results are material and manpower economies running as high as 75%, while producing a better product.

The process called impact extrusion is where a slug of metal is placed in a punch-press mould or die and smacked by a punch with such force that it flows like butter into the desired shape. Tubes for toothpaste and shaving cream, for example, are made in this manner.

Experiments Pay Off

For two years Lockheed engineers have been studying how to adapt the process, relatively simple with soft metals such as lead and pure aluminum, to the tough aluminum alloys now used for aircraft parts.

Experiments and actual production experience resulted in design of a 1,000-ton impact extrusion punch-press, largest in the aviation industry, installed at Lockheed last summer. It was built by E. W. Bliss Company at Toledo, Ohio.

Fifteen small parts were immediately earmarked for manufacture by

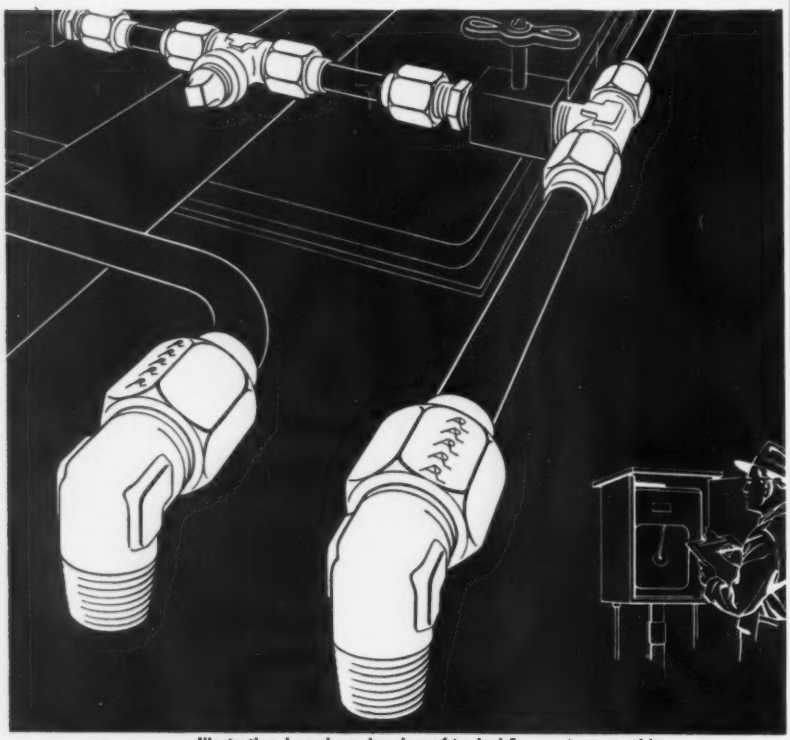
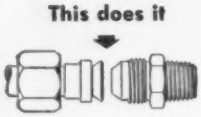


Illustration based on drawing of typical flow-meter assembly.

Tube it up...Forget it

WITH PARKER TRIPLE-LOK FITTINGS

This does it



Triple-lok . . . 3-piece flare fitting famous for its sleeve . . . the easiest way to install tubing systems. Made in brass, steel, stainless steel, aluminum alloy.

Parker Triple-lok Fittings — as specified by the A.S.M.E. Code for Pressure Piping and by J.I.C. and S.A.E. standards — are designed and precision made to be leakproof even under conditions of severe vibration, elevated temperatures, high pressure, and repeated reassembly . . . and to hold leakproof beyond tube-bursting pressures. Ask for Parker Tube Fitting Catalog 4300.

METROPOLITAN SUPPLY CO. MU 3261

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impact extrusion. Transfer of these particular 15 parts from conventional machining to extrusion meant an estimated saving of more than $52,000 a year.

The process, most practical on quantity production of 1,000 or more parts, can later be extended to 177 different Lockheed items for additional economies totaling hundreds of thousands of dollars annually, engineers predicted.

"Pint-size" electric brain scaled for business needs

A LITTLE BROTHER to giant electronic brains now in existence is under development at Consolidated Engineering Corp. The firm is aiming at a data-handling and computing system suitable for modern business needs.

Initially, the system will be made available for military uses in the fields of guided missiles, wind tunnel experimentation and jet engine testing. Eventually, however, businessmen who deal with a large volume of figures will be able to cut effectively the number of man-hours required to solve complex problems confronting them today.

Complexities of modern business require a short-cut method of compilation and correlation, and Consolidated's system is striving to meet the various requirements with the development of these two data-handling and recording instruments, both to be used in conjunction with the same computer. Sadic, the first instrument, converts data into special arithmetical terms which are then fed into the computer. Millisadic, the second instrument, operates at phenomenal speeds but does not carry the converted data to as many decimal places as the Sadic. Sadic will therefore be used where data comes in at a comparatively slow rate, while Millisadic will be right at home on jobs requiring reception of 1,000 signals a second, or 3,600,000 an hour. The system complete with computer will require about the same amount of space as a 6-ft. man and an office desk.

Another scholarship

AS A PART of its continuing program to encourage the teaching of highway transportation courses in colleges and universities and to aid students studying for a career in motor transportation, Pacific Intermountain Express has established a third P-I-E Scholarship in Highway Transportation at the University of Utah. The other two are at Northwestern and Stanford.

HOW MUCH LOST PRODUCTION DO SLIPPING ACCIDENTS COST YOU!

ACCIDENT REPORT

Cause of accident:
Man slipped on oily machine-tool base.

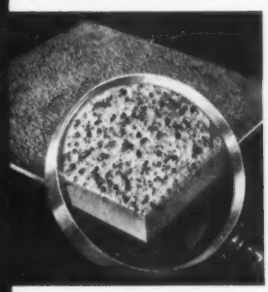
Means of prevention:
Install A.W. ALGRIP Abrasive Rolled Steel Floor Plate.

Count the cost of slipping accidents—in lost man-hours, production lag, and insurance premiums. We think you'll see, at once, how much less it costs to put positive non-slip protection in your plant with exclusive A. W. ALGRIP Abrasive Rolled Steel Floor Plate.

NON-SLIP—EVEN ON STEEP INCLINES!

We make ALGRIP by rolling rough, tough abrasive grain (the kind you'll find in grinding wheels) uniformly as an integral part of the steel plate's upper portion. Hundreds of these tiny abrasive safety brakes grip your feet at every step—prevent slipping, even on wet or oily surfaces, even on steep inclines!

ALGRIP WON'T WEAR SMOOTH!



ALGRIP's safety is more than surface deep. The abrasive grain is distributed evenly and deeply, so that as the surface wears, new particles are exposed. Result: ALGRIP keeps its anti-skid qualities for a lifetime—without maintenance. And because rolled steel makes it stronger than other abrasive floorings, ALGRIP withstands hard blows and heavy loads—can be used in thinner sections without reducing load carrying capacity.

LEARN HOW LITTLE SAFETY COSTS TODAY

Our new Booklet A-6 gives full technical details, suggests uses for ALGRIP. We'll be glad to send you a copy and answer any questions you may want to ask—without obligation. Write us today.

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Over 125 years of iron and steel making experience.

for the best solution to that handling problem...

● When faced with material handling problems—whether they involve conveying pounds or tons—keep in mind the service of Mathews' Engineers which is readily available to you—Engineers who can help you to get the right answers to these problems without confusion or delay.

You will find that it pays to depend on such experienced sources of supply, for behind your Mathews' Representative is a large engineering staff, a highly skilled production force, a modern western plant and a background of nearly 50 years of service to western industry.

So, when handling problems turn up, give them to Mathews' Engineers. You'll be glad you did.

MATHEWS CONVEYER COMPANY WEST COAST
SAN CARLOS, CALIFORNIA

LOS ANGELES PORTLAND SEATTLE
DENVER HONOLULU, T. H. SALT LAKE CITY

Setback for strikers from Utah Supreme Court

EMPLOYEES who assist in strike activity in Utah industrial establishments are not entitled to unemployment compensation benefits, according to two separate opinions handed down by the Utah Supreme Court.

In one case, the Court ruled that employees who refused to cross a picket line thrown around their place of employment by another union have "left work voluntarily without good cause," and are therefore not eligible for unemployment compensation.

In the second case, the Court ruled that when a labor union strikes one company where industry-wide bargaining is carried on, management of other companies in the group may close down and union employees thus thrown out of work cannot be paid unemployment benefits.

In this second case, the Associated General Contractors were negotiating with the AFL craft unions when the unions elected to strike at only two of many building sites. The AGC then closed down all building operations, putting several thousand union men out of work. As a result of this united employer action a satisfactory agreement was arrived at within three days.

The State Industrial Commission ruled that the employees were entitled to unemployment compensation, and the AGC appealed the decision to the Supreme Court who ruled in reverse.

Lumbermen save breath . . . by voting name change

IT WAS A LONG HIKE over the adjectives, prepositions and nouns which formed the names "Joint Committee on Forest Conservation of the Pacific Northwest Loggers' Association and West Coast Lumbermen's Association," and later "Forest Conservation Committee of Pacific Northwest Forest Industries," but the confusion is gone. Douglas fir forest landowners have now taken the simpler name "Industrial Forestry Association."

Function of the newly-titled association will remain the same. The IFA will continue to represent the private forest groups in relations with the public, with the government, and in cooperative fire prevention programs.

OIL SHORTAGE?

California may have to be an oil importer by 1955

"WE HAVE enough oil in California for a very few years more, but I believe that we are finally approaching the day when there will be a shortage of overall crude oil production. I would put the date at 1955." So prophesied Robert L. Minckler, president of General Petroleum Corp., at a talk before the National Federation of Financial Analysts Societies at San Francisco last month.

Continuing this trend of thought, he indicated that it did not mean an oil shortage in the West because the Pacific Coast oil industry would come up with whatever means necessary to supply demand. Movement of oil into the West has already started (Standard is bringing in Sumatran oil at the expected rate of 20,000 barrels daily), and as individual companies begin to feel the pinch of short supply, that movement will increase.

New Supply Sources

For example, he rated the new Canadian oil fields, in Alberta, as the most likely to start filling the supply-demand gap.

"The Trans-Mountain Oil Pipe Line is now under construction and will be completed in 1954. The first movements will be to supply the British Columbia market, but the line is being built so that it can move 200,000 barrels per day.

"With present well-head prices in Canada and with the present import duty on oil, Canadian crude cannot be landed on the West Coast and compete with California crude at present prices, but these price differentials will somehow disappear if there is pressure from surplus producing capacity in Canada, or pressure from product demand on the Coast.

"If and when Canadian oil becomes an important source of West Coast supply, it will mean the development of an oil refining industry in the Pacific Northwest."

Hopes in Utah

Eastern Utah's Uinta Basin is rated second to Canada as the most likely source of supply for the West. Although the Uinta Basin is largely an unexplored region, some important discoveries have been made there and an aggressive exploration program is under way.

Other possible sources of important volumes of crude oil for the West are: the western part of the Rocky Mountain region, eastern Nevada, and the San Juan Basin of New Mexico, Colorado, Utah and Arizona. Unlike the Uinta Basin, these basins are relatively unexplored and as yet no important discoveries have been made, but there are large sedimentary basins with plenty of room for big oil fields.

When it comes to a contest between West Texas crude into California vs. Canadian oil to the Pacific Northwest, logistics favor the Canadian movement by a wide margin.

"As to our refinery situation," continues Mr. Minckler, "We have a statistical surplus of refining capacity. The quality of this surplus is poor, consisting mainly of straight-run units which cannot profitably operate at the existing levels of crude oil and products prices. I do not believe that there is any over-all excess efficient refining capacity in this district. Some new capacity is now being built, and additional capacity will be built, probably in the Northwest.

"All of these forecasts are based on two hopes. They are:

1. No general war engulfing the world, and
2. No further loss of freedom in the United States."

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Portland 14, 735 S. E. Union Ave.
Seattle 9, 404 Dexter Ave.
San Diego, 703 Eighth Ave.

"OPERATION SHIRTSLEEVES"

Jobholders in the plant happily fire questions at top management, and both groups benefit

FACIAL EXPRESSIONS are good evidence that the meetings were not dry and ponderous.

"JOBHOLDER" meetings are an innovation which Pillsbury Mills, Inc., have found highly satisfactory. A representative panel of four administrators meets with a large group of employees who submit questions in advance, and every question is answered. People find out what they want to know, and set their minds at rest regarding what makes the company and their industry tick.

Union officials, representing some of the jobholders, were present on the side lines as spectators. When it was over, A. E. O'Neal, secretary-treasurer of Teamsters Local No. 196, observed, "If more employers would be willing to lay their cards on the table like this, our job would be easier."

Most recent of these meetings were held Feb. 20 and 21 at Los Angeles, when employees at Culver City, Mill "A" and grocery and bakery sales department, attended one—and employees from Colton, East Los Angeles mill and elevator, East Los Angeles office and the feed sales department, attended the other.

Approximately 400 Pillsbury people, their husbands and wives, sat down to talk things over. Both sessions were devoted entirely to questions and answers. No speeches or presentations were admitted.

Employees had submitted about 200 questions, and management had promised that every question would be answered. Even though some of those questions were quite pointed, they were all answered, frankly and completely.

Four management representatives constituted the management panel, and only a few hours before the meeting these men were presented with the set of 200 questions for them to answer. Panel members were: P. W. Pillsbury, president; B. J. Greer, vice president in charge of overall operations; A. W. Sparboe, vice president in charge of export; and W. B. Stevenson, head of the insurance department. H. M. Jones, personnel director in charge of West Coast operations, acted as moderator. Bill Doyle, Los Angeles Mill "A," was chairman at both sessions.

Like the other jobholder meetings, this one was arranged at the request of employees. Most of the 200 questions dealt with local problems and local interests, although a few were concerned with a more general interest. Here is a sampling of the questions and answers:

Question: What is the company's policy in making supervisors?

Answer: In selecting supervisors there is no set policy, but generally we look for a man or woman who, in addition to technical competence, has the potential training to lead and to train others. Training is an important part of supervision.

Question: Why doesn't the company do more of the institutional type of advertising like the Union Oil Company, Studebaker Company, and Warner-Swazey Company?

Answer: There is controversy among advertising men as to whether this kind of advertising is really ef-

fective, but the real reason we don't do it is that we want to spend our time, money and effort *first* on doing a better job of passing out information within the company. An affair like this is an example. When we get the internal job done, we can then think about talking with people outside the company.

Note: There were 13 questions asking if it would be possible to establish a credit union for Los Angeles employees.

Answer: So many indicated interest in a credit union that a poll will be taken of all employees in Southern California. If interest proves to be as strong as it appears to be, a committee of employees will be appointed to investigate a credit union. The establishment of a credit union is always something that is entirely in the hands of employees themselves. The company plays no part in it. Credit union funds must be derived entirely from deposits made by employees, and before a credit union can start loaning money, it must have some money on deposit. It also requires the time and effort of an employee committee to manage its affairs. In other words, there is responsibility and work connected with the establishment of a credit union.

Question: Has Los Angeles Mill "A" been sold?

Answer: No.

Question: At what ages can a man retire besides 65?

Answer: With the consent of the company, an employee may retire on the first of any month following his 55th birthday.

Question: What is the current picture on the reduction of milling capacity in the United States? Is it declining at the accelerated rate which was apparent two years ago?

Answer: The surplus milling capacity in the United States had some demand made on it with the coming of the Korean war. Mills which had excess capacity found that, temporarily at least, it would be needed. Now within recent weeks the demand resulting from the Korean war is beginning to fall off, and it appears that highly competitive conditions will again prevail in the industry as a result of unused capacity.

Question: What is the extent of the participation by employees of the present stock buying plan that the company has recently made available to all employees?

Answer: As of the middle of February, about 120 employees were participating.

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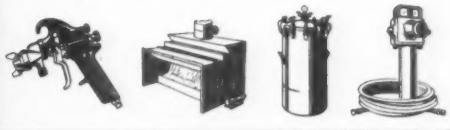

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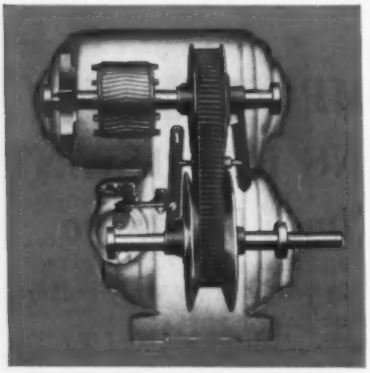

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70 ILLUSTRATIONS showing how Sterling Electric Power Drives reduce production costs. Write for Bulletin No. B 131.

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Offices and distributors in all principal cities

HELPFUL LITERATURE

for the plant operator who wants to keep informed

601

"Facts about product finishing equipment"

This is the title of a new folder issued by *Currier Co.* which tells how equipment built by this firm accomplishes this industrial operation—by means of photographs, diagrams and explanatory text.

602

How to get more payload with less maintenance

Great Lakes Steel Corp. has for you a 38-page booklet fully illustrating its type of Stran-Steel floor that can help any plant owner realize a better operating ratio due to reduction of costly truck and trailer floor replacements.

603

Unit seal booklet

Edward L. Parsons Co. has for our readers a piece of literature describing the unit seal manufactured by *Gits Bros. Mfg. Co.* Folder contains a specification chart to help you insure perfect shaft seal efficiency.

604

Check your compressed air performance

CCA Products, Inc., has just released a catalog on its line of air filters, filter-lubes, after coolers, air regulators, and de-humidifiers which should be of interest to all those concerned with compressed air operations. Vapor and performance charts are included. Get your copy from *The Rucker Co.*, 4228 Hollis St., Emeryville, Calif.

605

Comprehensive study of hardwood pallets

Job-engineered and standard type pallets are illustrated with suggested uses, load limits and other important data in a 16-page booklet issued by *National Pallet Corp.* Bulletin comprehensively covers use and application of hardwood pallets for all phases of materials handling.

606

New Signode catalog is complete and helpful

Shippers and receivers will be interested in checking their strapping applications against the latest information just published in the new Signode No. 15 catalog. This new complete work on steel strapping, seals, tools, accessories and applications embodies all the latest changes in designation and a full description of new products produced since 1949. This booklet should be helpful not only to top management and production managers, but also to traffic managers and shipping superintendents responsible for damage free shipping commodities. Published by *Signode Steel Strapping Co.*

607

Tips on cost and quality control

"Selectrol," a positive cost and quality control machine, manufactured by *The Exact Weight Scale Co.*, is fully described in a colorful brochure published by that company. Learn how this unit automatically weighs, classifies and sorts large volumes of similar objects, in units of one, into precise over, under and correct weight groups.

608

Advice for those who would subcontract for defense

"Subcontracting for Defense," a 36-page publication prepared by the *Chamber of Commerce of the United States*, gives sound advice to manufacturers seeking subcontracts for defense production orders. Tips for uncovering leads and for landing the contract after it has developed, comprise the contents of this valuable publication.

609

Read about cutting costs in fusion welding operations

Solar Aircraft Co. publishes a new booklet outlining cost-cutting solutions to common problems in metallic arc, inert arc, and other fusion welding of alloy steels, and describing available types of flux produced by Solar. Booklet illustrates sources of common difficulties in welding alloys. It also describes how its back-up flux reduces welding time as it removes dirt and oxides, aids even penetration, prevents burn-through, protects the back side of the seam, and supports the molten weld metal.

610

These case histories tell lots about foundry mechanization

How a foundry can be mechanized for increased production, better castings and improved working conditions is the topic of new Book No. 2439, pub-

lished by *Link-Belt Co.* This is a selection of actual case histories, foundry layout drawings and installation photographs. Dramatic contrasts are made between original methods and modern mechanical handling in molding, pouring, cooling and sand preparation through use of sand reconditioning machinery, shakeouts, and conveyors for molds, sand and castings.

611

Valuable information on the welding of mild steels

The McKay Co. issues a manual which describes the procedure for welding mild and low alloy steels and gives complete information about the electrodes available for such welding. Specifications, operating characteristics, mechanical properties, uses and other essential data on all low alloy and special purpose electrodes are clearly and briefly presented. Another section of the book is devoted to McKay electrodes especially designed for hard surfacing and repair welding in such applications as railroad switch points, frogs and crossings; building up worn parts on earth moving equipment and burnishing rolls; shear blades, tools and dies; punching and cutting tools.

612

This one can help solve your case hardening problems

Doughty Laboratories, Inc., has for you a 24-page illustrated "Hard-N-Tuff Idea Book" which describes 36 specific cases in which manufacturers have cut production costs, saved steel and prolonged life of tools and parts through a new method of case hardening. Booklet contains 8 hardening hints to help you overcome common hardening problems, effect economies and improve results. Also included is a step-by-step description of Hard-N-Tuff process.

613

Inside telephone handbook

A folder just released by *Automatic Electric Co.* explains how private, inside business telephone systems bring increased efficiency to large or small business organizations. Folder discusses savings, installation, equipment, planning, and offers a free comprehensive survey.

614

Interchangeable size table of metal powder bearings users

Wel-Met Co. has compiled and published an interchangeable size table for users of metal powder bearings. Four-page folder lists 133 MPA standard self-lubricating bearing sizes, gives their inside and outside diameter and

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length dimensions and shows corresponding part numbers of interchangeable bearings as produced by six other American bearing manufacturers.

615

Businessmen should plan for record survival

"A Plan for Record Survival" has been prepared by *Diebold, Inc.*, to help businessmen in evaluating their particular record survival problems should atomic war strike. This timely book should be a "must" on your reading list.

616

Materials handling catalog

An attractive two-color catalog featuring attachments, tools and accessories designed to lower cost and increase ease of handling materials with Hyster industrial trucks has just been released by *Hyster Co.* Brochure includes model views, diagrams, specifications and action pictures.

617

A study in lubrication

An illustrated booklet, published by *S. C. Johnson & Son, Inc.*, outlines the basic requirements of good lubrication and lists the many types of operations in which wax lubricants have been found to be ideal. The 20-page booklet describes the application of wax lubricants in the metal working industry.

618

New material is lighter than aluminum, as strong as steel

An attractive 24-page booklet just released by *Russell Reinforced Plastics Corp.* describes "Reinflastics"—a low pressure laminate of reinforced Fiberglas and nylon, which is lighter than aluminum but as strong as steel. This material has applications in almost every existing industry because of its unique combination of properties.

619

Unit steam generator manual

A new 28-page bulletin No. 2000 especially prepared for engineers, and architects for their guidance in understanding advance design features in unit steam generator types, has been prepared by *Preferred Utilities Manufacturing Corp.*

620

"Better, Faster Finishing for Production and Maintenance Jobs"

This is title of a colorful, informative bulletin on industrial sanding applications published by *Pneumatic Division of Sundstrand Machine Tool Co.* Brochure contains advantages of straight-line sanding and specifications on four models of sanders produced by this firm. Included are illustrations showing how air sanders are used for a great variety of plant operations.

621

Tips on tires

Monarch Rubber Co. is offering a catalog on its line of industrial tires covering all types of solid and cushion industrial rubber tires used on material handling vehicles.

622

Speed reducer manual

Detailed information on how to select double reduction gearing, examples of selection, horsepower rating tables, dimension sheets and complete physical data on *De Laval Steam Turbine Co.'s* line of double worm and helical-worm gear speed reducers is now available from that firm.

623

A plan for conserving and increasing battery power

Gould-National Batteries, Inc., is offering a two-color, 17 x 32-in. check chart designed to improve maintenance of motive power batteries. Chart tabulates five basic maintenance operations and shows how often each should be performed. This chart, illustrated with five cartoons, establishes rules to follow in charging, adding water, keeping records, cleansing batteries, and handling them safely, easily and efficiently. It also explains how accurate records keep maintenance men informed about battery conditions.

624

Home study text on materials handling

A new text on materials handling, designed especially for home study has been prepared by *International Correspondence Schools*, Scranton, Pa. Written by Harry E. Stocker, mate-

where to buy....
COFFING hoists
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rials handling consultant, new book covers equipment and methods used to handle material in production plants and in warehousing and storing. A section is also included on selection and training of personnel.

625

"Practical Hints on How to Solder"

Federated Metals Division, American Smelting and Refining Co., has published a new 16-page booklet on the fundamentals of soldering, entitled "How to Solder." It contains simple instructions and illustrations aimed at making soldering more successful and easier to do. Here is a wealth of information for those concerned with soldering operations.

626

A wealth of engineering data on dust control systems

A 24-page bulletin, "Manual of Exhaust Hood Design," featuring engineering data on dust control systems for the metal working industries is being offered our readers by *American Air Filter Co., Inc.* It illustrates and discusses design of exhaust hoods for many operations such as polishing, buffing and grinding; portable and flexible shaft grinding and polishing; cast iron machining; and automatic buffing and oil mist control. In addition to 61 photographs of actual dust control installations showing various methods of hooding dust sources, booklet also contains tables of exhaust requirements plus information on dust concentrations, weights of collected material and other engineering data.

627

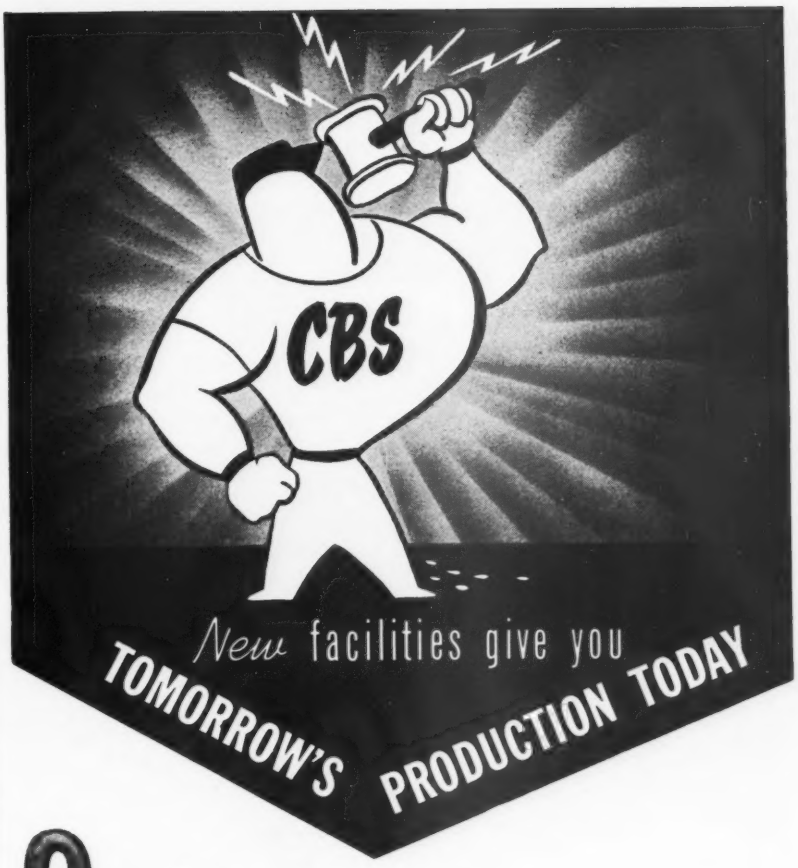
Complete listing of asbestos building materials

A reference manual containing a complete listing of 800 building materials and industrial products obtained from asbestos, asphalt or magnesia has been published by *The Philip Carey Manufacturing Co.* Manual shows Army, Navy, MIL, Federal, ASTM and other specifications, plus their corresponding product. All information is cross-indexed.

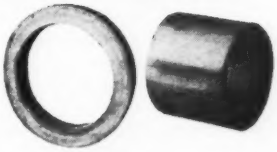
628

An overload cut-out can save you time and trouble

Everyone concerned with continuous operation of machine tools and conveyors will be interested in a bulletin published by *John Waldron Corp.* describing that firm's automatic, positive, mechanical, electrical and controlled device which instantly shuts off motor when an overload occurs. This equipment can save you time and anxiety.



.....flat die forgings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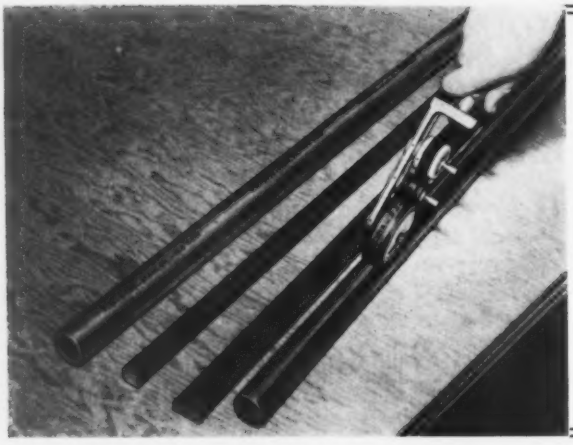
NEW MATERIALS & EQUIPMENT

COUPON ON PAGE 77
provides an easy way to obtain more information on products introduced.

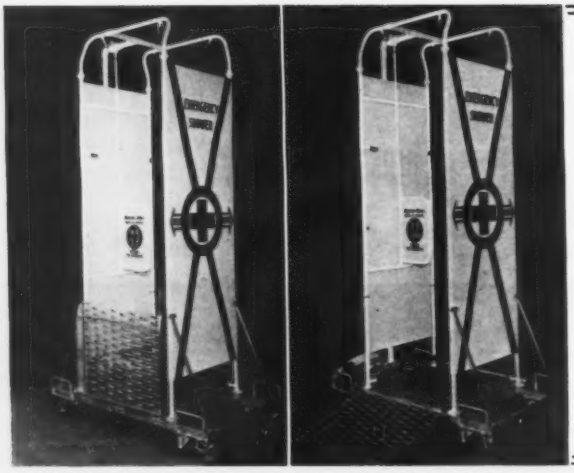
630—Angle-head drill

A new air-powered lightweight half-inch angle drill manufactured by *Mall Tool Co.*, allows better-than-normal access to hard-to-get-at places in tight quarters. Angle head can be swiveled to any position relative to the throttle by simply loosening a single nut. Motor is one of the most powerful and efficient air motors ever designed. Built-in regulator provides variable speeds. Built-in automatic oiler provides proper lubrication, eliminates need for line oiling. Lever or button throttle, and fitted with Jacobs chuck.



631—Rolling identification

A new high-speed manual device for marking identification on material, purchase order or other desired information on bars, tubes, rods and sheets of metal, plastic, glass, wood, rubber, composition. Imprints a permanent legend 3/16 in. wide by 8 in. long in a continuously repeated pattern over entire length of material in one quick operation. Automatically reinks after each impression, and copy is easily changed. Known as RAM-601 by *Adolph Gottscho, Inc.*, manufacturer.



632—Portable emergency shower

Emergency showers are now being widely used in industry, in schools, and in laboratories to meet the increasing risks of hazards of fire, acids, radiological, bacteriological and other contaminants to the human body. Instantaneous wetting and washing of all parts of the body and clothing of persons exposed has been found very effective in reducing serious injuries. *Logan Emergency Showers, Inc.*, provides this portable unit to do just that job, wherever and whenever you might need it.

633

Shorter galvanized coating bar makes for easier metal bonding

"Galvalloy," a galvanizing coating bar that will bond to any metal without use of a flux, has been reduced in length from 16 to 14 in., thereby becoming easier to use and reducing possibility of breakage. To use Galvalloy merely rub it on the pre-heated surface and it will bond to such an extent that you cannot burn it off even though you heat the base metal to a cherry red. Manufacturer is *Metalloy Products Co.*

634

Low priced microfilm camera cuts record storage costs

A new compact, portable and motorized microfilming camera that sells for a fraction of the usual cost, can produce great savings in record storage costs. Over 7,000 letters can be placed in one roll of film and a four drawer letter file filled with microfilm can house complete contents of an entire file room. "Flofilm" camera eliminates all loading, threading and film handling through its magazine loading feature. Manufacturer is *Diebold, Inc.*

635

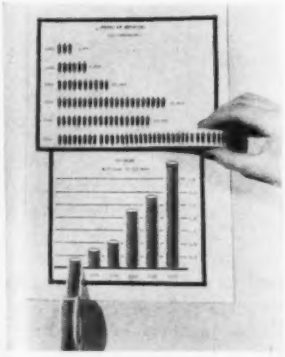
This carton lifter uses no pallets

Pallets are eliminated, and two cartons are lifted at once with this pallet lifter. It is operated by simply placing carton lift in contact with bottom carton and raising carriage. This moves spade-like arms of unit up and under interlocking cover flange, assuring maximum load stability for any handling operation. Carton lift is quickly interchangeable with standard forks. Arms can be adjusted laterally to handle cartons of varying widths. Manufacturer is *Towmotor Corp.*

636

Graphs and charts come "by the yard"

Anyone can make professional looking graphic charts with "Pictographs" produced on pressure sensitive tapes. Initial patterns designed by *Pictograph Corp.* include figures of men, women, children, stacks of coins, stacks of bills and others. Each symbol is repeat-printed on rolls of self-adhering tape 5/8 in. wide and 300 in. long. "PictoTapes" are easy to use since they adhere readily to many materials. Available from *Chart-Pak, Inc.*



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Write today for quotation and delivery or engineering assistance.

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651 WALSH AVENUE SANTA CLARA, CALIF.

637

Electric hand lamp gives brilliant prefocused light

"BigBeam," a portable electric hand lamp, manufactured by *U-C Light Manufacturing Co.*, has a hermetically sealed beam bulb that seals out dirt and moisture from mirrored surface of reflector and gives brilliant prefocused light. It is powered by one standard 6-volt lantern battery and its lamp-to-battery pressure-type contacts permit battery replacement in seconds. Its four-in. lamphead and comfort-built handle are chrome finished. Battery case, made of 20-gauge steel, is weatherproof and rustproof, and finished in red baked enamel. Switch is conveniently mounted on lamphead. Because of its low price, it is ideal for sportsmen, farmers and motorists as well as for a wide group of industrial applications.

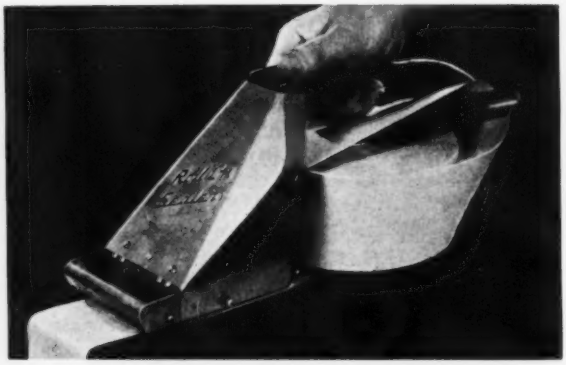
638

A flexible coating that will not crack

A new protective coating that withstands many chemicals employs a special plastic that is effective at temperatures from subzero to 400 deg. F. This coating, called "Leak Lock," adheres to most surfaces and may be used to protect all types of equipment. No curing is required. When air dried, coating has a smooth, glossy finish. Leak Lock, which may be brushed, sprayed or dipped, will not crack or peal when scratched or hit. Made by *Highside Chemicals Co.*

639

Sealing brought to the carton



New portable gummed tape machine, called "Roll-On-Sealer," makes it possible to seal or re-seal cartons whereever they may be without moving them to the shipping room. The machine rolls freshly moistened tape directly onto the carton, can be used in any position, and dispenses 600-ft. rolls of sealing tape or reinforced filament tape in widths up to 3 in. Marketed by *Mid-States Gummed Paper Co.*

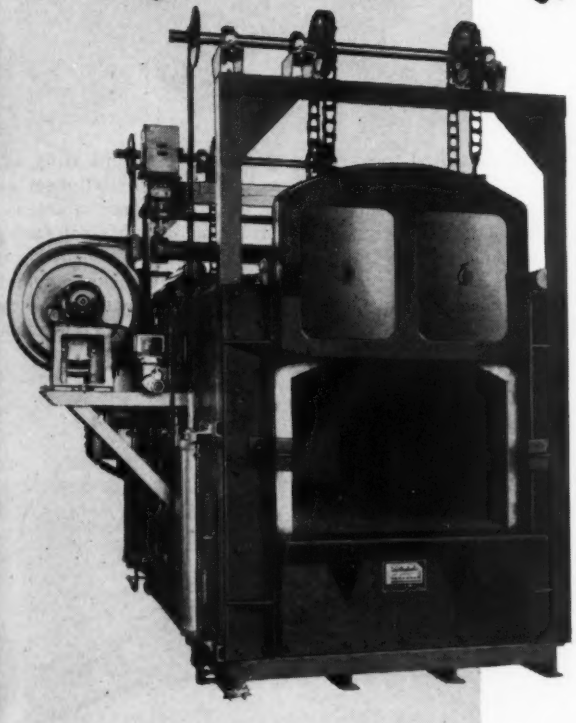
640

Threadless malleable fittings for one-piece piping systems

A line of threadless malleable iron fittings for piping systems where pressure and temperature are both moderate is now being produced by *Stanley G. Flagg Co.* These "Flagg-Flow" fittings are for brazing to standard black steel or wrought iron pipe. Their use results in a "one-piece" system as strong as the pipe itself. Full strength of pipe is utilized when joined with these threadless fittings because pipe loses wall thickness by threading. Excellent for installations subject to vibration, in concrete for radiant heating and on small pipe where welding is expensive and difficult.

400° TO 2200°

WITHOUT READJUSTMENT OF BURNERS OR CONTROLS



THERM-O-FLO

"Wide Range"

HEAT TREAT FURNACES

WITH ONE FULLY AUTOMATIC CONTROL you fire, set and maintain any uniform temperature within a range from 400° F. to 2200° F.—on direct fired or semi-muffle furnaces. Burners maintain positive ignition at all firing rates and flash back is impossible. Therm-O-Flo Furnaces are suited for 2 position, 3 position, floating, or full proportioning controls—electric or air operated.

For complete details and specifications write for Bulletin F-104.

- **A large number of smaller firing points, carefully located, provide accurate heat distribution and longer refractory life.**
- **Side baffles and carefully located flues control heat flow to assure even temperature distribution and rapid transfer to work.**

GAS, ELECTRIC OR OIL THERM-O-FLO FURNACES OF ALL TYPES AND SIZES ARE AVAILABLE FOR ALL HEAT PROCESSES.

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Industrial Process Equipment for the Application or Extraction of Heat and Moistures

OVENS DEHYDRATORS KILNS FURNACES AIR CONDITIONERS
PROCESS VESSELS AND TANKS WASHERS SCRUBBERS DEGREASERS
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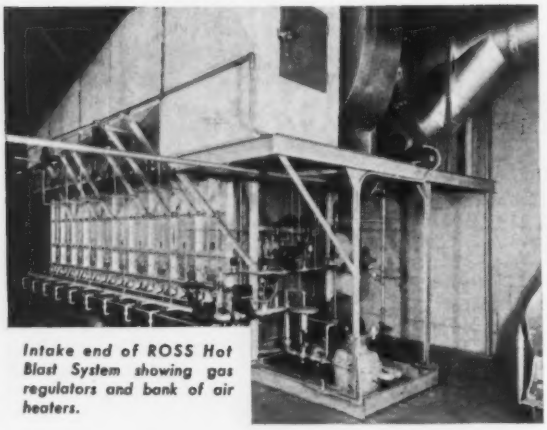
Cutting Costs For Coke and Labor *with*



Intake end of ROSS Hot Blast System showing gas regulators and bank of air heaters.

ROSS *hot blast* CUPOLA HEATING

The secret of the savings being secured in the Richmond, California plant of American Radiator & Standard Sanitary Corp. lies in the hotter iron obtained from operating their ROSS Hot Blast System. This modern method of preheating the air to the cupolas produces substantial saving in coke and silicon, reduces loss due to rejects and cuts maintenance expense to the minimum. At present costs for fuel, labor and material, no modern foundry can ignore such savings. Write for particulars.

Better utilization of air to solve processing problems has been the ROSS specialty for more than 30 years. ROSS Air Heaters, Drying, Baking, Curing and Heat Treating Ovens are recognized "tops" from a standpoint of design, construction and performance.

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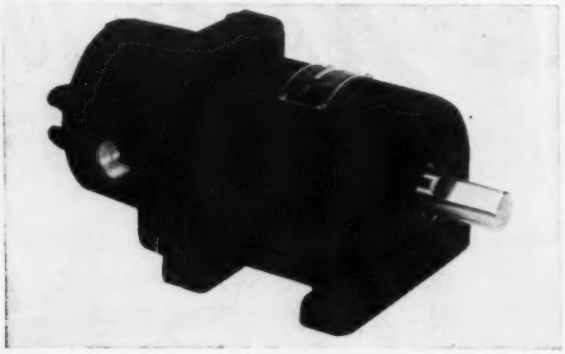
641

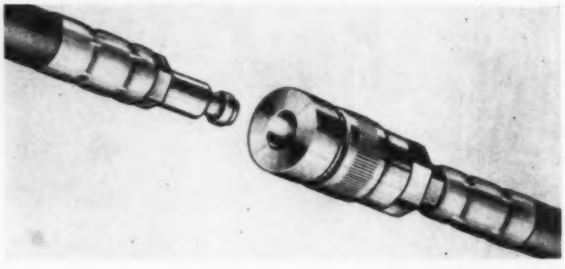
Heavy duty tachometer head measures speeds accurately



Well suited for measuring speeds of cement kilns, ball mills, metal working machines and other installations where ruggedness and long life without maintenance count, is a heavy duty tachometer head available from *Metron Instrument Co.* Speeds from 200 to 10,000 rpm. are easily measured. All working parts and terminals are enclosed against dirt, abrasives and splashing liquids. Connections to head can be made from any one of four approaches and head can be mounted in any position.

642

Airline quick-coupler has speedy push lock design



Fast one-hand coupling and uncoupling of airline accessories is assured by the "push-to-lock, push-to-release" design of a new automatic air coupler. Spring loaded tapered collar on coupler body exerts pressure against hardened steel balls which grip grooved male adapter. To connect, male adapter is pushed in; finger pressure against coupler end ring instantly uncouples line. Coupler is firmly locked while engaged. Swivel action is provided and air is automatically cut off when uncoupled. Connections are ¼-in. pipe thread. Available from *Nelson Specialty Corp.*

643

Tension-pull load binder

Tension-pull at end of lever on this load binder, manufactured by *David Round & Son*, maintains constant pull at every lift, and solid tension at back prevents spreading. Continuous bites may be made, and all tension is taken up at first loading. Handles on all models are I-beam construction for greater strength. Flat type hooks provide easy access. Swivels on all models remove undue strain on chain and binder.

ANOTHER FIRST BY ARO

Instant PUSH-BUTTON Reverse

Actual Size

Try this REVOLUTIONARY screw driver and nut setter yourself and FEEL its AMAZING reverse action. Your ARO distributor will be glad to arrange an on-the-job demonstration.

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I am interested in learning more about the new ARO Model 7500 Screw Driver and Nut Setter with *push-button reverse action* . . .

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ARO

AIR TOOLS

Also . . . LUBRICATING EQUIPMEMT . . . HYDRAULIC EQUIPMENT . . . AIRCRAFT PRODUCTS . . . GREASE FITTINGS

644

Industrial truck has table that tilts

An industrial truck, available from *The Hamilton Tool Co.*, has a tilting table top, 24 x 96 in., that rotates 360 deg. on a horizontal axis and can be locked in place wherever stopped. Back plate supports broach holders and fixtures as table tilts work to convenient position for service. Table service is 30 in. from floor. Truck rides on two wheels and four casters for easy maneuverability in restricted space. Floor locks at each end prevent unwanted movement. Capacity is 3,000 lb.

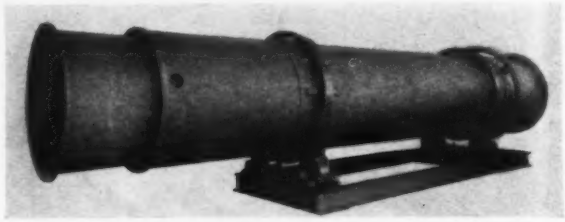
645

For a wider lighted area

A new addition to *Smoot-Holman's* fluorescent luminaires extends usable light areas by an increased width that accommodates four lamps—side by side. Sides of this luminaire flip open to permit lamp changing and cleaning without removing the unit's component parts. Finish is white synthetic enamel applied and baked on metal specially treated against rust and corrosion. Side panel shielding of heavy, stable polystyrene serves to absorb excess surface brightness. Louvers of 20 gauge steel are anchored to panels and individually secured to lower housing section to increase strength. Pedestal or hanger mountings for single or continuous run may be used for installation.

646

Aluminum chip reclamation speeded by rotary dryer



Reclamation of aluminum chips and machine tool cuttings is considerably speeded by use of a rotary dryer manufactured by *Standard Steel Corp.* Aluminum cuttings are fed directly into this dryer, into a temperature of about 100 deg. F. Residue of grease and coolant compound on metal is evaporated or partly burned by the combined action of the high temperature and contact with burner flame. Dryer is 5 ft. in diameter, 30 ft. long, and has an exclusive patented double-shell construction to stabilize mounting and to permit easy and economical replacement of inner liner shell.

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- Engineering and Design
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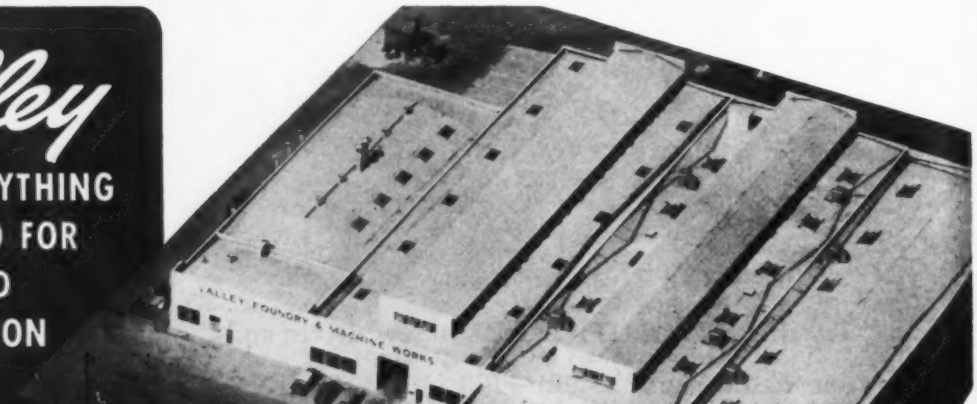

When limited facilities restrict your production capacity, Call Valley Foundry. At Valley's new, modern Fresno plant, all of the facilities listed here are available to help you meet and maintain heavier production schedules.

On sub-contract or prime contract, for big company or small, Valley's skilled workmen hold to the same high standard of craftsmanship, meet delivery schedules on time.

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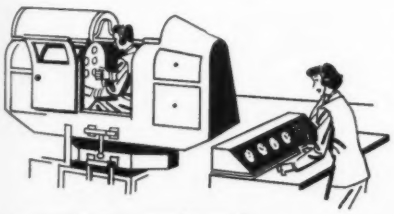
Need corrosion-resistant fans for process work? Equipment for dust or fly ash collection? Do you have a specialized or complicated ventilating problem? Read how American Blower Air Handling equipment can help you.



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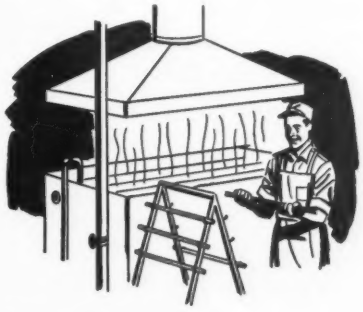
Long before aircraft instruments are accepted for use, they are thoroughly evaluated in special laboratories. And in the testing of precision instruments, as with many other processes, close control of temperature and humidity is vital. Recently one of the newest and largest instrument laboratories selected American Blower equipment for heating, ventilating and temperature control – a fine compliment not only to American Blower quality but also to our own research and testing methods.

DO AWAY WITH DUST

If you have a problem involving dust or fly ash collection, American Blower will be glad to help you. We have a wealth of experience in this field which covers both dust and fly ash removal in industry and public utilities as well as the recovery of valuable materials from air. In addition to local, on-the-spot assistance from our branch office personnel, a modern fully equipped research laboratory is maintained in Detroit to serve you.

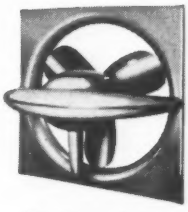


FUME REMOVAL

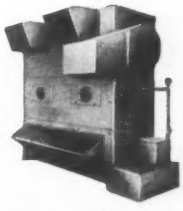
If you're planning to enlarge your metal-processing facilities American Blower offers special fans to handle the corrosive fumes, gases or vapors. For example, some corrosive gases are necessary to process work and must be circulated in the system with corrosion-resistant fans. In other cases, fumes and gases which affect the health and comfort of employees must be safely and effectively removed.

Whatever your requirements American Blower heating, cooling, drying, air conditioning and air handling equipment will improve over-all comfort and efficiency in your business. For specific information, phone or write our nearest branch office.

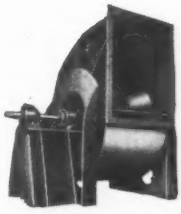
Unit Heaters



Ventura Fans



Air Conditioning Equipment



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Utility Sets

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One-ball trolley illustrated

Note the high carbon steel drop-forged swaged type bracket, retainer type ball bearings, double labyrinth grease seals, flangeless steel wheels with hardened and ground races.

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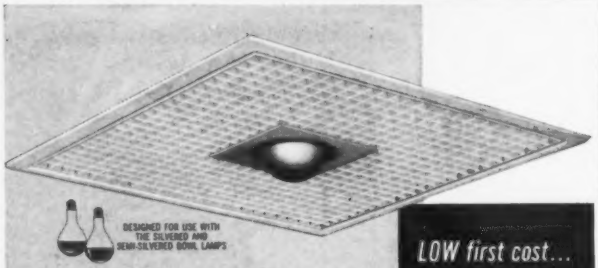

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LOW upkeep...
LOW brightness!

Look into Skylike modern architectural lighting systems—you'll like what you see! Because Skylike systems are designed to bring efficient, low brightness illumination to every application with an initial cost less than systems providing equivalent lighting. They are equally adaptable to suspended or ordinary ceilings. Exclusive features include relamping from floor, built-in reflector surface, silvered bowl lamps. Available in light output to suit your needs. No ballasts, starters or blinking lamps. Simplicity of construction assures easy maintenance, low upkeep!

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SMOOT-HOLMAN
INGLEWOOD, CALIFORNIA

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Use coupon on page 77 for more information

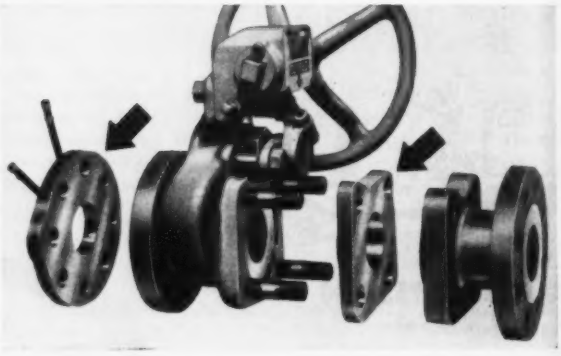
647

A truck designed for work in tight spots

The Yale & Towne Manufacturing Co. is now manufacturing an extra heavy-duty low-lift platform power hand truck for horizontal transportation of skids and skid bins. This high-capacity truck has very small dimensions and is very suitable for work in confined spaces. Platform is 11 in. high with 3 in. of lift. For operation on ramps it has 5 in. of under-clearance. Platform is 26½ in. wide and 42 in. long. Raising platform does not increase its overall length.

648

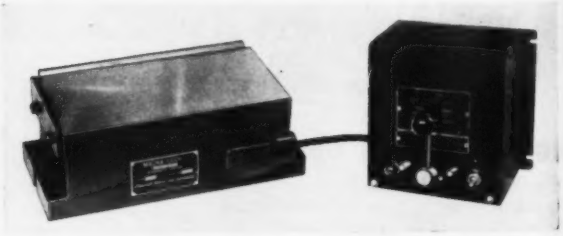
Electrically-heated valves solve temperature problems



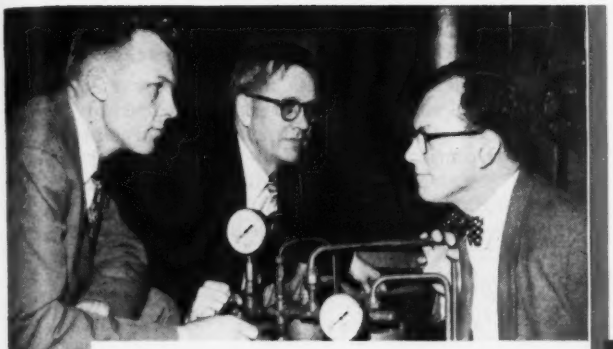
Designed to keep valve mechanisms clear of frost and ice in liquid carbon dioxide lines at temperatures as low as —110 deg. F., are these electrically heated valves. Valves are equipped with heating elements which transmit heat directly to valve seat and thus heat entire flow opening through the valve, in addition to operating the mechanism. All heated valve sizes from 2 to 6 in. are available with pneumatic, hydraulic, solenoid or manual control. Manufacturer is *Okadee Co.*

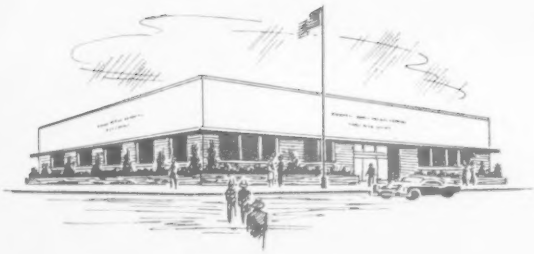
649

Magnetic chucks for small machine tools and bench work

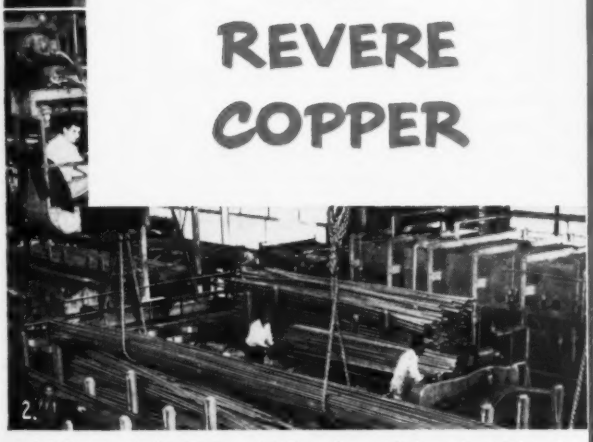


All the advantages of magnetic chucking are now available for smaller machine tools and for bench work through the addition of three new small electromagnetic chucks to the line of magnetic chucks and devices manufactured by the *Hanchett Magna-Lock Corp.* These chucks, sizes 5 x 10 in., 6 x 12 in., and 6 x 18 in., facilitate holding work pieces for hand sawing, scraping, layout, filing, welding, drilling, grinding and similar operations. Chucks are precision built, all steel, and operate on AC voltage. They have 22% more magnetic area, permitting pieces to be positively held to extreme edges of chuck. They are moisture and shock proof.





G. P. SURVEY PLEASES BRASS AT REVERE COPPER



1. G. P. Representative Ed Parrott, left, confers with Revere's chief engineer Dalton C. Bergan, center, and Rod and Tube foreman Robert Derr. 2. Copper and brass tubing await finishing operation. 3. Brass tubing shown emerging from extruder.

Three years ago when Revere Copper and Brass, Incorporated, opened its Pacific Coast Division office in Los Angeles, General Petroleum's Lubrication Engineers were called in for a survey of the plant's machinery.

As the lubrication needs of each piece of equipment were charted and analyzed, the G. P. Lube Engineers set up a regular service schedule which Revere put into effect and has followed ever since.

Today, the large extrusion machine which shapes the plant's copper tubing, as well as all other equipment included in the original survey, continues to run smoothly and efficiently without lost time due to improper lubrication.

Revere's works manager, J. L. Woodall, credits much of the plant's maintenance success to the G. P. products and lube engineering which have helped keep production humming at a steady rate.

The G. P. Lube Engineer in your area is well qualified to assist you in solving your maintenance problems. He'll show you how you can reduce lubricant inventories while setting up a service schedule that's tailor-made for your plant.

Call him in for a lubrication survey today!

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GENERAL PETROLEUM CORPORATION

—Converting nature's gift to better living.

11-16

WANTS VICTOR'S STEADY FLAME !

VICTOR Safety Regulators give the man on the job the even gas flow he needs for efficient work. They hold setting over the entire pressure range, right down to the bottom of the cylinder, without time-wasting adjustments . . . enable your operator to do a better job faster.

See for yourself how VICTOR Safety Regulators reduce costs by saving gas and labor, the big items in any welding or cutting job. Phone your VICTOR dealer for a demonstration TODAY.

Precision-built, long-wearing VICTOR Safety Regulators are made for almost every gas and use, for pressures up to 5000 p.s.i., and volumes to 2000 c.f.m.

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See your VICTOR dealer NOW. *He will gladly show you why it costs less to own and operate VICTOR. Dealer inquiries invited.*

VICTOR EQUIPMENT COMPANY

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650

Hydraulic drum up-ender for fork trucks

Without leaving their seats, fork truck operators with an economical hydraulic drum up-ender developed by *Baker-Raulang Co.*, can pick up, transport, stack and empty heavy drums. Drums can be rotated 90 deg. for vertical or horizontal stacking, or tilted 45 deg. below horizontal for emptying at any height within lift range of the truck. The operator can maintain complete control from his seat with dash-mounted controls.

651

Versatile intercom system has eleven optional features

Adaptable to practically any individual or specific need is an intercom system called "Talk-A-Phone." It can be equipped with any or all of the following features: busy signal; redi-power; dynasonic performance; multi-magic selector; privacy handset; earphone; right-of-way relay; hold-a-matic pushbuttons; silent touch bar; uni-trans and conference features. Unit is encased in streamlined cabinet. Manufactured by *Talk-A-Phone Co.*

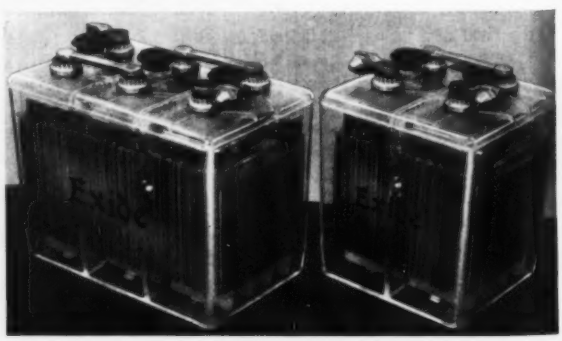
652

Pipe and bolt threading machine with self-contained die head

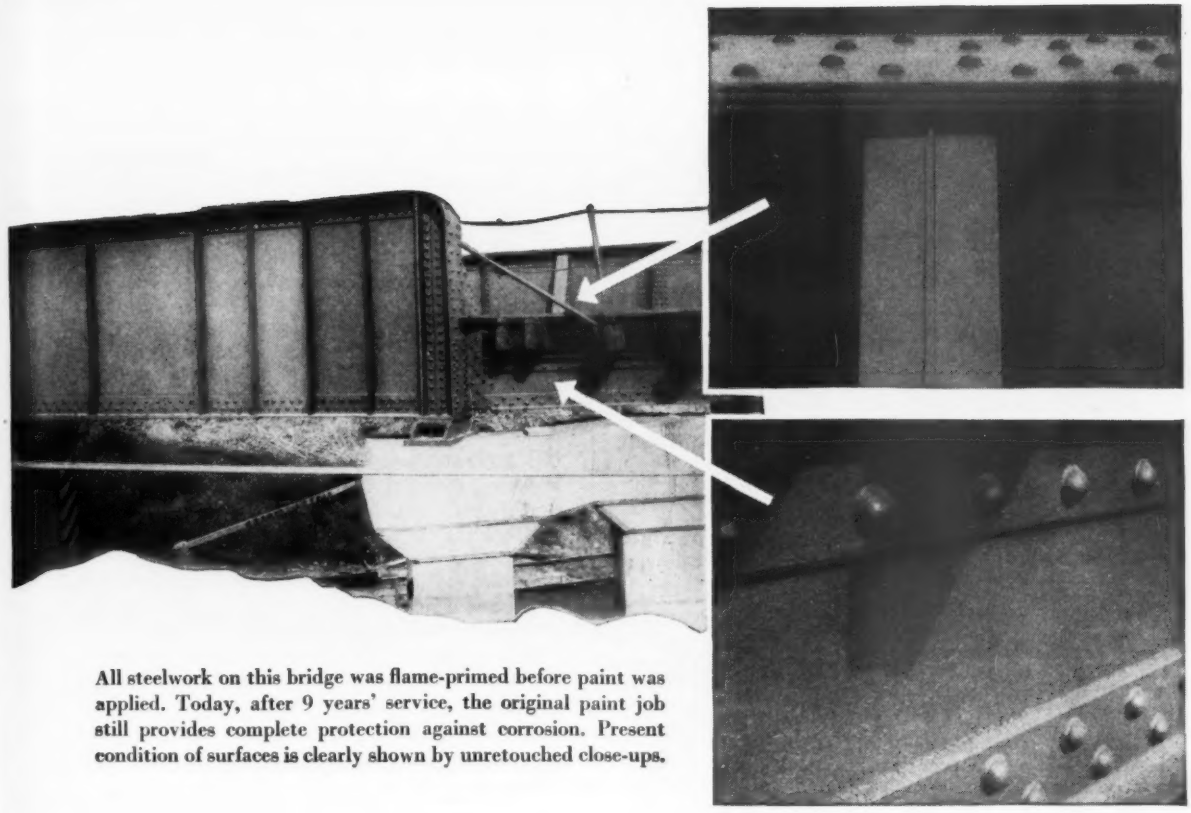
Ridgid "500" pipe and bolt threading machine has self-contained die head which reduces initial cost and saves time and work. Head is instantly adjustable to thread 1- to 2-in. pipe, regardless of position of quick-opening lever, without removing dies or die head from machine. All tools on unit thread, cut and ream independently and right up close to chuck, and swing out of way when not in use. Thread and length gauge has large, easy to read numerals. Chuck has six adjusting pinions so one is always handy. Motor supplies ample power even for 12-in. diameter pipe when geared tools are used. Manufacturer is *The Ridge Tool Co.*

653

Storage batteries for stationary applications



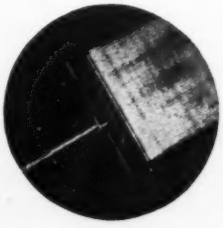
A new line of storage batteries of two- and three-cell construction, designated as Exide Type PLX, is now available from *The Electric Storage Battery Co.* These batteries, which offer advantages in space and weight saving, maintenance and improved dependability have transparent polystyrene plastic cases which show at a glance the level of the electrolyte and the approximate state of charge. An automatic venting device of clear polystyrene built into each cell prevents excessive gas accumulation—an added safety factor. Two-cell units have 50-ampere hour capacity at eight hour rate; three-cell units have 100-ampere hour capacity at same rate.



All steelwork on this bridge was flame-primed before paint was applied. Today, after 9 years' service, the original paint job still provides complete protection against corrosion. Present condition of surfaces is clearly shown by unretouched close-ups.

Your Steelwork . . .

How Will It Look in 1960?



Steelwork you coat with good paint today can still look like new ten years from now, *if you flame-prime all exposed surfaces first.* And what you'll save on maintenance, because of increased protection due to flame-priming, will more than pay for all the flame-priming apparatus and materials you need for the job.

Flame-priming is simple to do, requires little equipment, and costs little. A brush of oxy-acetylene flames pops off scale and drives out moisture. Paint applied to the warm, dry surface goes on quickly and smoothly, bonds tightly, and lasts longer.

Flame-priming is one of many time- and money-saving LINDE methods for making, cutting, joining, treating, and forming metals. So, whatever you do with metals, there is a good chance that LINDE know-how, show-how, and equipment can help you do it better, more quickly, or at lower cost.

To find out, without obligation, telephone or write our nearest office today. LINDE AIR PRODUCTS COMPANY, a Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y. Offices in Other Principal Cities. In Canada: Dominion Oxygen Company, Limited, Toronto.

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Products and Processes for MAKING, CUTTING, JOINING, TREATING, AND FORMING METALS

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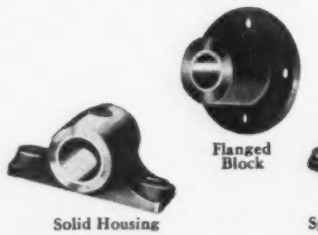

LINK-BELT

Babbitted Bearings are better 7 ways!

1. PROVEN BABBITT—A completely balanced formula developed over many years' experience as best for general applications — securely anchored to the housing.
2. ASSURED ALIGNMENT—Base of casting is ground for uniform backing.
3. FAST, EASY ASSEMBLY—Elongated mounting holes are surrounded by smooth areas—less chance for stripped nuts.
4. LONG LIFE—Correctly lined up and properly lubricated, they last for years.
5. COMPLETE LINE—Pillow blocks with solid or split housings. Flanged blocks. Grease or oil lubricated and self-oiling types.
6. CAREFULLY PACKED—All are protected to reach you in factory-finish condition. Popular sizes are shipped in convenient cartons.
7. EASILY IDENTIFIED—Recessed decals give serial number and size.

For all the facts, contact your nearest Link-Belt office.

LINK-BELT

LINK-BELT COMPANY
PACIFIC DIVISION
Plants and Factory Branch Stores: San Francisco 24, Los Angeles 33, Seattle 4. Offices and Factory Branch Stores: Portland 9, Spokane 13, Oakland 7. 12.354-P

REALOCK FENCE

All fittings on Realock Fence have bolts so placed that nuts cannot be removed from the outside. This means that Realock Fence provides *added protection* for your grounds and property . . . effectively discourages tampering by would-be trespassers.

Strongly constructed, Realock Fence has high resistance to the elements because of a special galvanizing process . . . gives permanent protection and trouble-free service year after year. For additional information write our nearest sales office or consult your classified telephone directory.

THE COLORADO FUEL & IRON CORPORATION – Denver, Colorado
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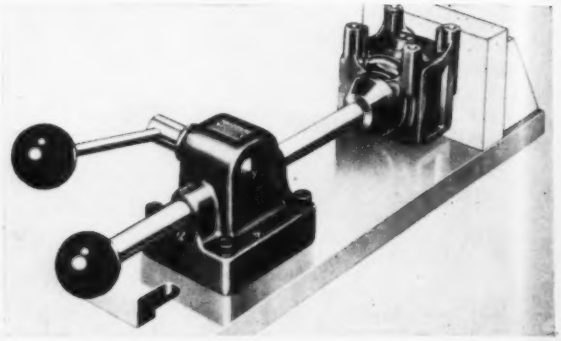
WICKWIRE SPENCER STEEL DIVISION – Buffalo, New York

REALOCK FENCE
THE COLORADO FUEL & IRON CORPORATION
CFI
BRANCHES IN ALL KEY CITIES

654

Quick-acting locking device without screws or clamps



National Machine Tool Co. is now manufacturing a screwless quick-acting locking device for adapting to jigs and fixtures that does away with slow screw type clamps and holding tools. A simple push or pull on bar knob sets device at any desired position. A holding pressure up to 1,500 lb. is exerted by a light press on the locking lever. This unit is adaptable to a wide range of machining and assembling operations using metal, wood or plastic stocks. A 1-in. portion on the end of the bar has been left soft by the manufacturer, permitting device to be fitted to specific jobs.

655

Dual temperature pipe insulation

A low cost scientifically designed Fiberglas insulation for pipe lines operating at low temperatures or at alternate

"Western Made For Western Trade"

SOCKET SCREWS

Made of Stainless Steel, Alloy Steel, Aluminum or Other Material. Commercial or Aircraft Quality.

STANDARDS AND SPECIALS

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Fast Delivery From Our Factory Stocks

QUALITY SOCKET SCREW PRODUCTS

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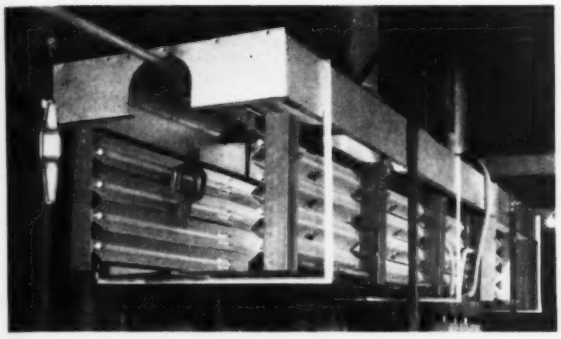
cycles of high and low temperatures is being manufactured by *Owens-Corning Fiberglas Corp.* It is made of fibrous glass bonded with a thermosetting binder and is accurately preformed in easy-to-apply hemi-cylinders and segments that fit all standard pipe and tubing sizes. This insulation may be used on pipe temperatures from sub-zero to 25 deg. F. It needs no additional finish.

656

Radiant ray infra-red industrial heater



Ideal for industrial use is a radiant ray infra-red heater designed for single or multiple installation, either stationary or portable. Heat ray tubes are mounted in Alzac parabolic reflectors to provide even heat radiation entire length, thus eliminating hot spots. Tubes have a high safety factor and are unusually resistant to thermal shock and vibration. Installation, maintenance and operating costs are unusually low. Heater is a product of *Corona Manufacturing Co.*

CONTINUOUS ROLLED METAL SHAPES AND TUBING offer a wide scope and variety as to size and design. They can do a better job with less waste and at less cost than by ordinary methods. Perhaps you can use Special Sections to advantage in your business.

▶ *Additional information concerning DRAKE SPECIAL SECTIONS is yours for the asking.*

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This sun's so strong our goods will fade."

"For any type of fast repair,
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Almost all your business needs—services or products—are listed in the Yellow Pages of your Telephone Directory. Classified is your handy guide to local people who sell or serve. So when you need repair work done, or when you need most any product, find it fast in the Yellow Pages. Just as other buyers will find you fast when you advertise in Classified.

You'll find it fast in the

YELLOW PAGES

of your Telephone Directory

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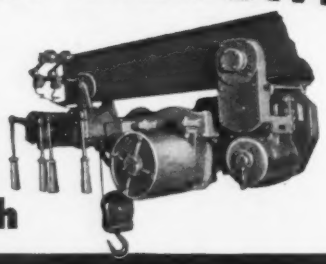
STRETCH MANPOWER



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Just one man can lift and move those heavy loads around your plant, with ElectroLift.

Safe, compact, smooth, quiet, fast... with a choice of many models for any use. Capacities up to 6 tons. Optional pushbutton control gives pin-point accuracy.

For further features, consult your Electro-Lift representative in telephone directory.

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- LONGER-LASTING COLD RUBBER INSULATION!
- GREATER FLEXIBILITY!—engineered, rope-like flexibility.
- MORE CONVENIENCE! Jackets are branded with full identifying data. Coils are packaged in neat shelf cartons.

Bears symbol "P116BM," flameproof registration number of the U. S. and Pennsylvania Bureaus of Mines.

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Bronco 60 Certified is an Achievement of

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Use coupon on page 77 for more information

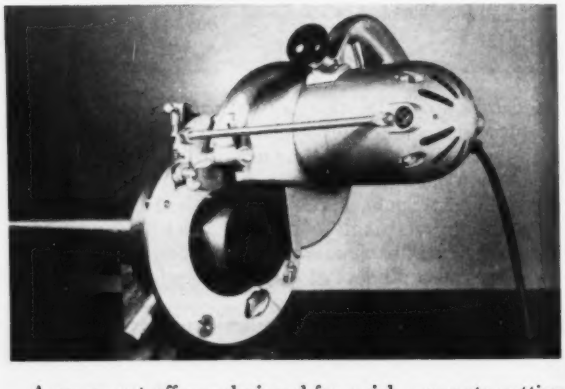
657

Dashboard button makes efficient doorman

Specifically designed for fork trucks, delivery trucks, fleet cars and other vehicles that must pass through the same plant door many times a day is an electronic door operator that opens and closes plant doors by remote control. Doors are raised or lowered by pushing a button conveniently located on dashboard of truck or car. On vehicles having no dashboard, button is located on side of seat within reach of operator. New unit is simple to install and can save from two to three man hours a day. Available from *H. W. Crane Co.*

658

"Super Speed" abrasive saw for cutting pipe and tubing



A power cut-off saw designed for quick, accurate cutting of pipe and tubing of aluminum, copper and stainless steel is now being produced by *Tri-Clover Machine Co.* A special heavy-duty, abrasive disc slices through metal quickly, leaving smooth, square, non-distorted ends. Saw has free-moving, rotating frame attached to it so that both frame and saw rotate together. Operator simply sets the saw to make the desired cut and rotates it 360 deg. on the saw frame, thereby cutting around the periphery of the tube or pipe until cut is complete. This light weight, portable saw is easily secured to any bench or bench vise and is quickly adjusted to any size tube or pipe.

659

Hydraulic scissors lifts for "level" up's and down's

For any type of lifting which requires maintenance of a working table height at all times, *American Manufacturing Co., Inc.*, has designed a line of portable scissors lifts with 3,000 to 8,000-lb. capacities and 30 to 36 in. travel ram lengths. They come equipped with steel decks, rolls or open bases. They can be serviced with fork lift trucks, dollies or skiffs. It takes one minute to go up and ten seconds to come down on all models.

660

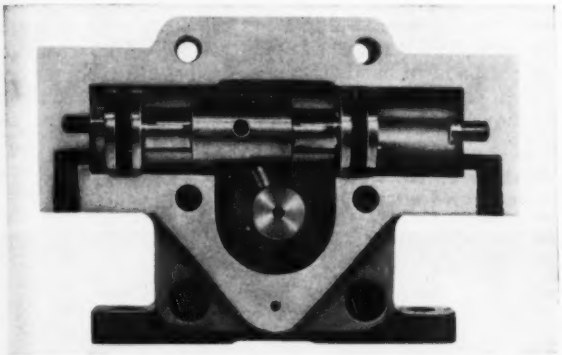
Steam cleaning compound will not clog equipment

Magnus 72 is a non-alkaline steam cleaning compound that is neutral in reaction and will not dull or streak paint. Due to its unsaponified oil content which works to prevent rust formation, it will not clog steam cleaning equipment. This liquid concentrate cleans fast and thoroughly, gen-

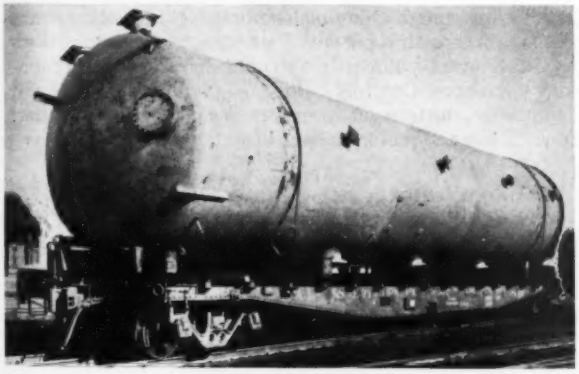
erates no objectionable fumes and can be used indoors where ordinary steam cleaners cannot be employed. Available from *Magnus Chemical Co., Inc.*

661

Power operated valve



The POV power operated valve, available in six sizes, is suitable for air, oil and water operation with option of finger, cam, toe or solenoid pilot controls. It is designed for use where hand and foot operated valves cannot be used. POV is essentially a standard four-way valve, but rotation of disc is accomplished by means of a piston moved by operating fluid pressure of main line, and controlled by small pilot valves suitably located and actuated. Applying pressures through pilot on one end of piston forces it to move ahead and rotates valve disc to forward position. Applying pressure to opposite end moves piston back and rotates disc to reverse position. Available from: *Ledeen Manufacturing Co.*



NEW! 3/16" RUBBER LINED TANKS

Designed for 50# PSI internal pressure, ASME Code, with 40,000 gallon capacity (11' x 56') ten 6" - 18" flanges, wood slats and mounting skirt if used vertically. Especially suitable for **cold water wood slat deaerating or scrubbing; acids, salt solutions, chemicals or edible liquid storage; gas absorption or extractions; smoke, gas or "smog" control.** Alterations to suit your needs. *Immediate delivery.*

$13,000.00 each. Weight: 50 tons with slats; 35 tons without.

ALSO: 14" and 18" rubber lined pipe, Blaw-Knox gratings, walkways, railings structural steel, contractor's equipment. Write or 'phone TODAY!

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Champion Lamps cost less than any other lamps of equal quality... and give you maximum light for every cent of current consumed.

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Nutting JACK
IT'S ALWAYS DEPENDABLE

The Nutting Jack is the ONLY jack operated entirely by gravity and leverage. With no springs to break, there is no danger of your whole jack-skid system suddenly being put out of service.

One lift truck and two dead skids cost about the same as two NUTTING JACKS and twelve semi-live skids. That's one reason why the Nutting Jack and Skid system can be such a money-saver in your plant. Material stored on semi-live skids is made mobile in a hurry. The jack may be coupled to one skid, then uncoupled and coupled to another faster than the time it takes to tell about it.

Contact our representatives below for complete information on the advantages of the Nutting Jack and Skid System, or write direct for Bulletin 48-JS.

WEST COAST REPRESENTATIVES:
DENVER—McDonald-Hunt Scale & Supply Co.....1540 Waxee St.
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LOS ANGELES—H. L. Stewart & Associates.....1547 Estudillo Ave.
OAKLAND—Roll-Rite Corporation.....801 Jefferson St.
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PORTLAND—F. E. Bennett Co.....426 N. W. 6th Ave.
SALT LAKE CITY—Equipment Supply Co.....16 Post Office Place
SEATTLE—Secord Sales Co.....95 Connecticut St.
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Special cold headed products
. . . nails • rivets • screws . . . made to order
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JOHN HASSALL, INC. 424 Oakland Street Brooklyn 22, New York
Los Angeles Representative: C. W. Warren Co., 646 N. Fuller Avenue, Los Angeles 26, California • San Francisco Representative: Albert M. Schweitzer, 228 Ninth St., San Francisco 3, California

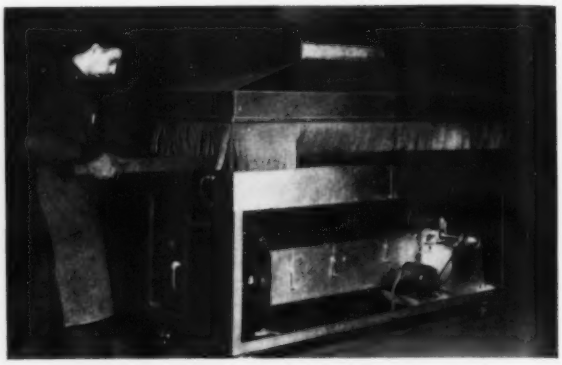
662

Automatic bottle sealing saves production costs

A continuously operating turret-type machine which applies cellulose bands to bottle necks automatically has been added to *American Machine and Foundry Co.'s* product line. Bander can apply wet cellulose bands to bottle necks at speeds ranging from 50 to 140 bottles a minute. It is capable of handling round, flat or square bottles and height can be adjusted to any size bottle from a half-pint to a quart.

663

Aluminum bar heating furnace where and when you need it



A portable type electric furnace suitable for heating special aluminum bars to approximately 300 deg. F., prior to forming operations, is now in production by *Pereny Equipment Co.* Unit is equipped with a blower to produce proper recirculation of heated air. A semi-closed opening for feeding and discharging long bars is provided by means of an asbestos strip curtain. Furnace is mounted on rollers so that it can be transported to immediate location of forming operations. Controls include temperature indicator and controller, instrument transformer, magnetic contactor, switch box and motor starter.

664

Writing a letter is as easy as talking on a phone

"PhonAudograph" is an economical telephone dictation system especially suitable for occasional users. With this equipment each user has a private line connected with the single recording machine. In addition to privacy, user has complete control of system, including complete lockout of controls on all other telephones. Dictator simply picks up his dictation telephone and talks. Other features include push-button control for unlimited "listen back"; similar control for indicating corrections or special instructions; private telephone line between dictator and secretary. Manufactured by *The Gray Manufacturing Co., Inc.*

665

Steel plate exhausters for conveying all types of material

This general duty, steel plate exhauster which is universal as to direction of rotation and discharge, is suitable for all types of material such as dust, smoke, fumes, vapor, exhausts, ventilation, cooling and blowing operations. For added safety and efficiency hub construction has no protruding arms. Eddy currents are eliminated, reducing shock and loss and providing smooth flow of material. All steel housing permits easy access to wheel and change of discharge and rotation direction. Manufactured by *Rees Blow Pipe Manufacturing Co.*

THE WEST ON ITS WAY

ARIZONA

ARIZONA PIPE LINE—Federal authorities grant permission to West Coast Pipe Line Co. of Dallas, Texas, for construction of a 125,000 barrel-per-day capacity pipeline from Wink, Texas, across Arizona to Norwalk, Calif. Petroleum Administration for Defense will probably assist in steel and other priority materials for $75,000,000 line upon application. PAD will also recommend a 25% accelerated tax amortization for project.

B-36 JOB FOR GOODYEAR—Consolidated-Vultee Aircraft Corp. awards construction contract for a large number of 3,000-gallon tanks used in B-36 Air Force planes to Goodyear Aircraft Corp. in Arizona.

COPPER SUBSIDY—U. S. government agrees to pay a subsidy of over ten cents a lb. above ceiling prices to keep Yucca Mining & Milling Co., Inc.'s Antler copper mine at Yucca in operation. Agreement calls for about 1,735,000 lb. of refined electrolytic copper yearly. A price of 34.355 cents per lb. f.o.b. El Paso, Tex., is guaranteed by government.

NEW FOUNDRY FOR PHOENIX—National Malleable & Steel Castings Co.'s newly acquired subsidiary, Capitol Foundry Co., makes plans for building a large new foundry six miles southeast of Phoenix. New facility will cover 55 acres and cost over $1,600,000, with annual capacity of 25,000 tons of cast steel grinding balls used in mining. Capitol considers construction of a $1,500,000 plant on same grounds for production of a general line of castings used in mining.

YUCCA EXPLORATION CONTRACT—Yucca Mining & Milling Co., Inc., Yucca, signs contract with Department of Interior for copper, lead and zinc exploration in Mohave County. Total cost of project is estimated at $69,896 with government's contribution set at $34,948.

LIME AID—Defense Production Administration grants certificates of necessity to Grand Canyon Lime & Cement Co. on two quicklime projects in Nelson.

EXCELSIOR MILL PLANNED—International Metal Products Co., Phoenix, plans to build its own excelsior mill sometime next year. Excelsior will be made from Arizona white aspen and will replace product now shipped in from out of state.

CALIFORNIA

BEST FERTILIZERS — Best Fertilizers Co., commercial fertilizer distributor in Northern and Central California, purchases 100 acres of land six miles south of Stockton as site for a new liquid phosphoric acid and pelleted fertilizer plant. Initial construction, soon to start, will cost over $700,000 with further additions costing another $1,000,000.

ROHR AIRCRAFT BUYS SITE—Rohr Aircraft Corp. buys an 80-acre site at Riverside and plans to build a complete manufacturing unit for production of power packages for Boeing C-97 Stratotankers. Construction of 200,000 sq. ft. plant will commence shortly, and, when completed, 2,500 workers will be employed with 5,000 planned for peak production period. Company also plans 45,000 sq. ft. expansion of its present plant in Chula Vista. Personnel of 5,100 presently employed is expected to increase to 7,000 by end of year.

YOLO REVIVES SHASTA'S IRON MINING—Yolo Steel & Metal Co. plans early revival of iron mining on its 500 acres in Shasta County's McCloud River

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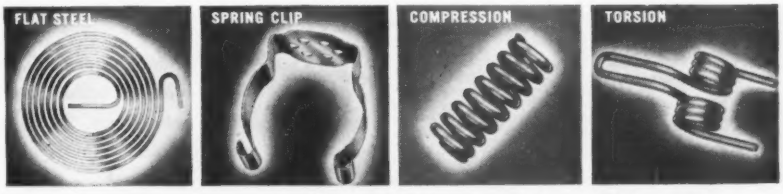

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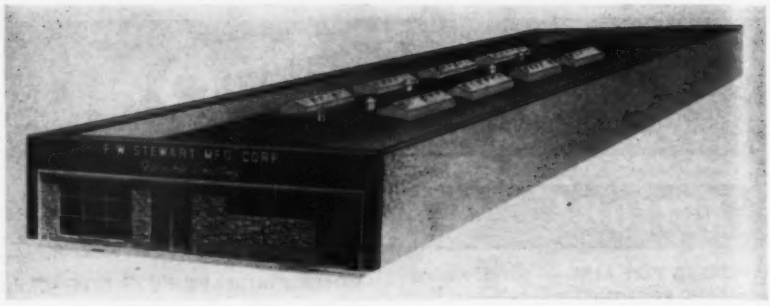
region. Property, leased from Shasta Iron Co., has produced high grade iron ore examined and approved by U. S. Bureau of mines.

SEAMLESS TUBE PLANT — Western Tube Corp. breaks ground on a 90-acre site at Dominguez for a $16,000,000 seamless tube plant. Facility, when completed, will cover about 500,000 sq. ft. Seamless oil-well tubing, drill pipe and casing will be produced in an estimated quantity of 100,000 tons yearly. Administrative offices will be in Whittier, Calif.

CERTIFICATES OF NECESSITY—Defense Production Administration grants certificates of necessity for plant expansions in interest of national defense to following California firms: Rohr Aircraft Corp., Riverside, for aircraft parts manufacture, is granted approval for investment of $2,013,283, with 65% of total eligible to be written off out of earnings in five years; General Petroleum Corp., Los Angeles, for three aviation gasoline projects, $1,810,700 investment approved with 45% write-off, a $7,979,300 investment with 65% write-off, and a $732,000 investment with 90% write-off; Southern Pacific Railroad, Roseville, for railway transportation, $1,453,726 approved with 40% write-off; Union Carbide & Carbon Corp., Los Angeles, for oxygen, nitrogen, $1,704,082 granted with 55% write-off; Lockheed Aircraft Corp., Los Angeles, for military aircraft, $839,361 approved with 65% write-off; Lockheed Aircraft Corp., Burbank, for aircraft and parts, $2,874,555 investment granted with 65% write-off; Pacific Valves, Inc., Long Beach, for steel valves, $146,403 with 65%; Uarco, Inc., Oakland, for business forms, $274,731 with 50%; Hallett Manufacturing Co., Inglewood, for generating sets, $129,992 with 65%; and Oil Terminals Co., Colusa, for petroleum storage, $247,490 investment approved with 40% write-off.

VISKING COMES TO CENTERVILLE —Visking Corp., Chicago manufacturer of casings for sausages and other meats, buys 18 acres of land near Centerville. Construction of a 30,000 sq. ft. building, costing around $200,000 will get underway almost at once. Expected to be completed Jan. 1, 1953, plant will provide jobs for about 100 workers.

INSECTICIDE RIGHTS FOR SHELL—Shell Chemical Corp., San Francisco, purchases stock of Julius Hyman & Co., Denver manufacturer of aldrin and dieldrin insecticides. Company will continue operation under its present name. Shell also comletes agreement with Velsicol Corp. of Chicago for exclusive, worldwide rights to aldrin and dieldrin.



STEWART OPENS NEW PLANT—F. W. Stewart Manufacturing Corp. opens its new Los Angeles plant at 1638 S. Flower St., giving additional manufacturing space over its previous location at 431 Venice Blvd. New location will be devoted to manufacture of flexible shaft assemblies, flexible shafting and their components.

SHELL OIL DRILLS AGAIN—Shell Oil Co., San Francisco, is planning nearly 225 wildcat and development wells, a record number, to be drilled this year in Pacific Coast area and Rocky Mountain region.

IRVINGTON PLANT FOR MONROVIA —Irvington Varnish and Insulator Co., El Monte, is building a $100,000 factory at 1601 S. Shamrock Ave., Monrovia. Plant should be ready for operation by July 15. One hundred persons will be on pay roll.

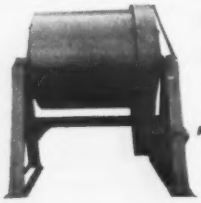
PACIFIC TUBE ADDS FACILITIES—Pacific Tube Co., Los Angeles, signs contract with T-S Construction Engineers, Inc., and Albert C. Martin and Associates, architectural engineers, for construction of additional facilities to company's present plant at 5710 Smithway St. New facilities will increase Pacific's stainless steel tubing production capacity by about 50% with a corresponding increase in output of alloy and carbon tubing and cold finish bars.

KLAMATH LUMBER MILLS PLANNED —Arrow Mills of Eureka and Simpson Logging Co. are both planning new lumber mill projects in Klamath area, northern Humboldt County.

RUDDOCK SELLS OUT TO HALLETT —Hallett Manufacturing Co. purchases Ruddock Co. for $300,000. Grounds and plant adjacent to Hallett's Inglewood facilities will house company's new aircraft and missile division. A laboratory to house over $100,000 worth of technical equipment is now under construction and will serve as a control factor for Hallett.

PG&E PLANS SIERRA PROGRAM—Pacific Gas and Electric Co. unfolds plans for a large new Sierra hydroelectric development in a projected $114,000,000 program on North fork of the Feather River. Four new plants, to generate a total of 364,000 kilowatts, will increase PG&E's North fork installations to ten plants with a combined capacity equivalent to 1,000,000 hp. Two projects, one at head of Butt Valley reservoir (36,000 kilowatts), and the other, a 109,000-kilowatt powerhouse to be built downstream from existing Caribou plant, will cost an estimated $36,000,000. Belden project, a 113,000-kilowatt powerhouse nine miles downstream from Caribou at mouth of Yellow Creek, will total $38,000,000. Poe project, a 106,000-kilowatt plant at upper end of Big Bend Powerhouse diversion dam, will cost an estimated $40,000,000.

DOUGLAS AIRCRAFT EXPANDS—Douglas Aircraft Co., Inc., plans expansion of its El Segundo division by approximately 1,000,000 sq. ft. by virtue of a new contract with U. S. Navy, requiring rehabilitation of a World War II aluminum plant at Torrance. Facilities will be used in producing parts for Navy aircraft. Plant property, consisting of over 200 acres of land and 1,000,000 sq. ft. of buildings is being acquired by



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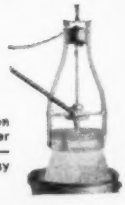

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Your copy of the Tool Steel Handbook will be sent—*without charge*—upon request. Our only stipulation: please make your request upon your company letterhead. ● Write Allegheny Ludlum Steel Corporation, Oliver Bldg., Pittsburgh 22, Pa.

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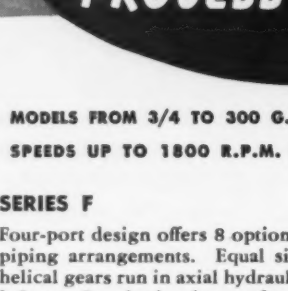

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Navy under condemnation action against Columbia-Geneva Steel division of U. S. Steel Co. Douglas options for lease or purchase of property are nullified by action.

WESTERN SKY INDUSTRIES LOCATES — Western Sky Industries, awarded a Douglas Aircraft Co., Inc., subcontract of over $3,500,000, locates in Oakland. It will manufacture wing sections for AD-4 and AD-5 Sky Raiders made for U. S. Navy by Douglas. Company plans to employ 400 workers on a $1,200,000 yearly payroll.

LOCKHEED LEASES SITE—Lockheed Aircraft Service, Inc., leases a 15-acre site at Ontario's International Airport, and will shortly start construction of a commercial service base of non-military nature devoted entirely to jet aircraft work. City of Ontario will own base, and jet airplanes will be modified and overhauled by L.A.S. A crew of 500 skilled workers from vicinity of Ontario is expected to have area completed and in operation by Sept. 15 of this year.

GENERAL FOODS EXPANDS — General Foods Corp., 2750 Halcyon Drive, San Leandro, plans major expansion of its plant to be used in manufacture of instant coffees.

MONTAGUE MOVES TO SAN LEANDRO — The Montague Co., manufacturer of heavy-duty cooking equipment, moves from its location at 369 Ninth St., San Francisco, to a 12,000 sq. ft. building recently completed at 135th Ave. and Alvarado in San Leandro. Montague's total investment in plant and equipment is estimated at $150,000. Thirty employees will be working at new plant.

ADDITION FOR INTERNATIONAL MINERALS—International Minerals & Chemical Corp. begins construction on an addition to its amino products plant at San Jose. New floor space will add up to approximately two-thirds more capacity for manufacture of monosodium glutamate. Two 8,000-ton storage tanks, a boiler, two cooling towers and two reagent storage tanks are being added to facilities. Construction represents an investment of about $1,500,000. Five new concentrators soon to be installed at sources of corporation's supply of Steffens filtrate in Idaho and Utah plants will come to about $1,800,000 more.

HART'S FRUIT JOINS RUDNICK—Hart's Fruit Products Co. of Brea, canner of citrus juices and frozen concentrates, is added to Rudnick Enterprises, Bakersfield. Rudnick Enterprises includes meat packing plants, cattle feed lots, ranches, grain elevators, fertilizer plants, cotton gins, cottonseed oil mills, warehouses, dehydrators and alfalfa mills.

ZERO HOLDS OPEN HOUSE — Zero Manufacturing Co., Burbank precision metal fabricator, holds open house, celebrating its purchase of Zierold Manufacturing Co., and appointment of James M. Dobbie as vice president and plant manager. John B. Gilbert is president of Zero.

KAISER EXPANDS PERMANENTE FOIL MILL — Kaiser Aluminum & Chemical Corp. will shortly begin construction and installation of additional equipment at its aluminum foil mill at

Permanente. Expansion will increase floor space 25%. Plant capacity will be boosted from 12,000,000 lb. to 18,000,000 lb. per year, and range of available foil widths will be nearly doubled. Accordingly, plant personnel will increase by 35%. Completion of plant is scheduled for early next year.

PANORAMA COMPANY FORMED—Steelbilt, Inc., 4801 E. Washington Blvd., Los Angeles, forms a subsidiary, Panorama Co., for production of sliding glass doorwalls in stock sizes and models. New plant, now under construction at 184th St. and Figueroa, Los Angeles, is expected to be finished by August. Plant and office will contain about 45,000 sq. ft., and will include cold roll-forming equipment to produce steel sections for both Panorama and Steelbilt.

UNION OIL MAKES DISCOVERY—Torrey 83, Union Oil Co. of California's discovery well 40 miles northwest of Los Angeles in Santa Clara Valley, is currently pumping 800 daily barrels of 18.5 gravity crude. Union owns 30,000 acres surrounding new Ventura County well, and a new location, 660 ft. from it, is being prepared for an offset, Torrey 84. Union is also getting ready to drill a step out well, Simi 17, about 2½ miles southeast.

STANDARD-THOMPSON BUYS CENTRIFUGAL — Standard-Thompson Co. of Dayton, Ohio, purchases Centrifugal Investment Casting Co. of Burbank, maker of aircraft industry and guided missile parts. Production of Burbank plant's special precision castings will be increased. Present management will be retained, and firm will operate as a subsidiary of Standard-Thompson Co.

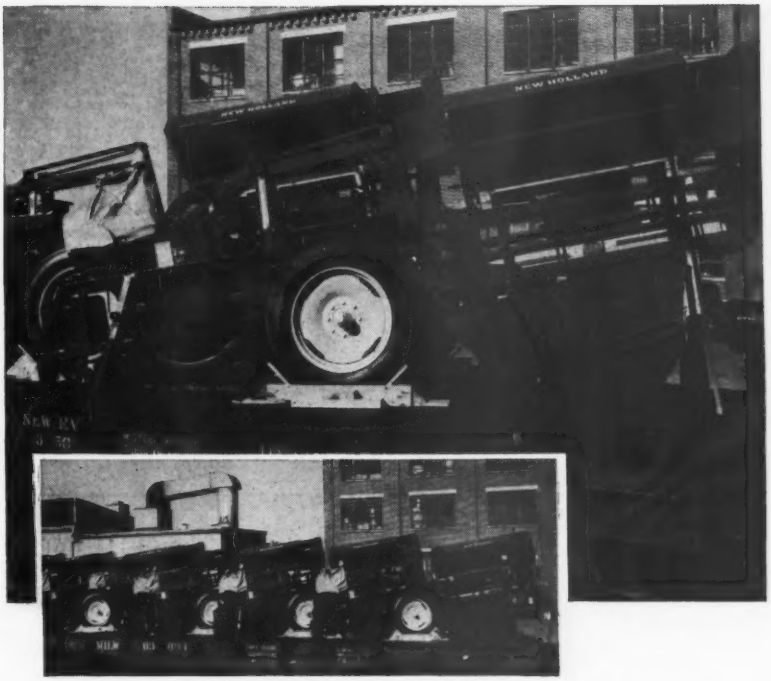
PASTURE LAND PURCHASED—In a joint purchase, Southern Pacific Railroad Co. and Leslie Salt Co. acquire 520 acres of W. B. Brinker Ranch in southern Alameda County. For $254,000, Leslie receives 254 acres of land parcel. Company will convert land into salt crystallization ponds immediately. Southern Pacific acquires 256 acres for $451,000. This will be held for future industrial building.

HENSLEY EQUIPMENT BUYS PLANT — Hensley Equipment Co., manufacturer of tractor accessory equipment, purchases McGown-Robbins Heat Treating Co. of San Leandro. Hensley, in addition to heat treating company products in new plant, will offer industry a complete facility for handling commercial heat treating.

COLORADO

LAMAR CHLOROPHYLL FACTORY —National Chlorophyll & Chemical Co., a new firm founded by National Alfalfa Dehydrating & Milling Co., plans to build a major plant near Lamar for production of chlorophyll and other alfalfa chemistry products. Plant is scheduled to be finished and in production by summer of 1953. Its output is set at 160 lbs. daily.

GAS PROJECT—Kansas-Nebraska Natural Gas Co., Inc., files application with state public utilities commission for its approval in an issue of first mortgage sinking fund bonds to amount to $3,000,000. Proceeds of sale are to go to



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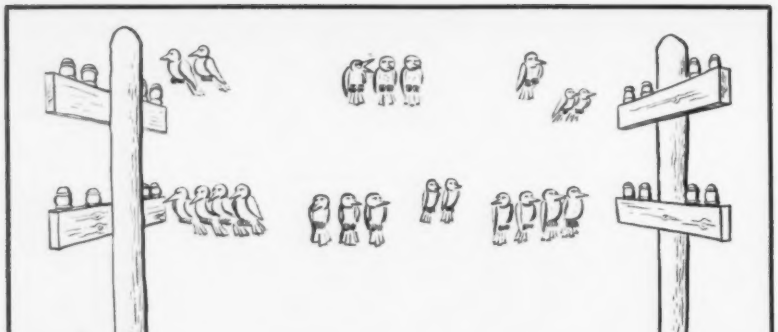

THINGS ARE TOUGH ALL OVER

(Copper situation as seen by President C. F. Bowers of Tristate Supply Corp.)

construction, improvement and extension of company's facilities in Sterling-Julesburg basin area.

NEW OIL SHALE UNITS—Bureau of Mines awards a $288,980 contract to Blaw-Knox Construction Co., Pittsburgh, Pa., for construction and installation of a new pilot plant retort and two oil-shale storage and distribution systems at Rifle. Three-part contract provides for a gas-combustion pilot plant No. 2, costing $107,920, a $79,470 raw shale storage and distribution system to serve all pilot-plant retorting facilities, and a $101,590 raw shale storage and distribution system for a demonstration-scale retort now under construction by same firm.

COKING COAL RESERVE — Through intensive search, Bureau of Mines, U. S. Department of Interior, has discovered over 108,000,000 tons of reserve coking coal in Coal Creek district of Colorado's Gunnison County.

WESCO TO OPEN RANGELY REFINERY—Wesco Refining Co. will shortly open its 2000-barrel-a-day oil refinery under construction in Rangely. A $250,000 refining plant bought in Jacksonville, Tex., has been dismantled and is ready for shipment to new plant.

IDAHO

IDAHO SELLS TIMBER—State sells to Ohio Match Co. almost 115,000,000 board feet of state-owned timber for $925,908. At the same time, a smaller tract containing 38,660,000 board ft. goes to Potlatch Forest, Inc., for $337,006. Both tracts lie adjacent in Shoshone and Clearwater Counties in Northern Idaho. Access roads to both tracts will total an estimated $920,000.

MONTANA

CHROME MINE TO REOPEN—Defense Minerals Production Agency approves a $1,750,000 loan to American Chrome Co., San Francisco, Calif., for re-activating production at Mouat chrome mine in Stillwater County. Stillwater deposit contains 85% of nation's known chrome reserves and has been inactive since World War II when it was operated for U. S. government by Anaconda Copper Mining Co.

CANNERY EXPANSION FOR POLSON—Expansion of cannery facilities to take care of $1,000,000 minimum gross business is hoped for in Polson. A produc-

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- ¶ How can cleaning costs be reduced 33⅓% while plating quality is being improved? *See pages 7 and 8.*
- ¶ What are four easy ways to improve the average rinse tank? *See page 10.*
- ¶ What rinsing fault is "an invitation to trouble" in the plating of high-carbon steel? *See page 11.*
- ¶ Why is it better to clean steel with reverse current than with direct current? *See pages 12 to 14.*
- ¶ What causes hydrogen embrittlement during electrocleaning? What is the remedy? *See pages 15 and 16.*

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tion survey and study of possible financing arrangements are underway for adding a large freezing and processing unit, plus a marketing unit to present cannery facilities.

NEVADA

NEVADA CERTIFICATES OF NECESSITY—Defense Production Administration grants certificates of necessity for plant expansions in interests of national defense to these Nevada firms: Western Electrochemical Co., Henderson, for a manganese dioxide project, approval granted for $161,746 expenditure with 70% of total investment to be written off out of earnings in five years; Hercules Powder Co., Henderson, for a torophene project, a $1,967,894 investment approved with 45% write off.

BMI SALE—Final sale of state-owned Basic Magnesium Plant near Hoover Dam should be finished this month. Five major industrial concerns taking over plant and townsite of Henderson include: Stauffer Chemical Co., U. S. Lime, Titanium Metals of America, Combined Metals Reduction Co. and Western Electric-Chemical Co.

SIMPLOT ORE ESTIMATE—J. R. Simplot Co. gets operations underway at its iron ore open pit near Palisade in north central part of state. It is expected that pit will produce 300,000 tons of ore in 1952. Mining and hauling program calls for some 150 workers. Ore will be shipped by Western Pacific and Southern Pacific Railroads to West Coast ports for shipment to Japan.

PIOCHE MANGANESE INSTALLS FURNACE—Pioche Manganese Co. announces immediate installation of major furnaces at the Basic Magnesium Industries plant near Hoover Dam. Placing of these units climaxes a two-year construction and remodelling program. The plant will be expanded to include a lead and zinc smelter, and employment should reach about 150 when operations begin.

BLACK ROCK SULPHUR MINE EXPANDS—Black Rock Desert Mineral Co. completes arrangements for installing additional milling facilities and a refining plant at its Black Rock sulphur property at Sulphur. A sum of $100,000 is allocated to increase mine's output to

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Solenoid operated switch automatically brings trolleys on parallel tracks into single track alignment.

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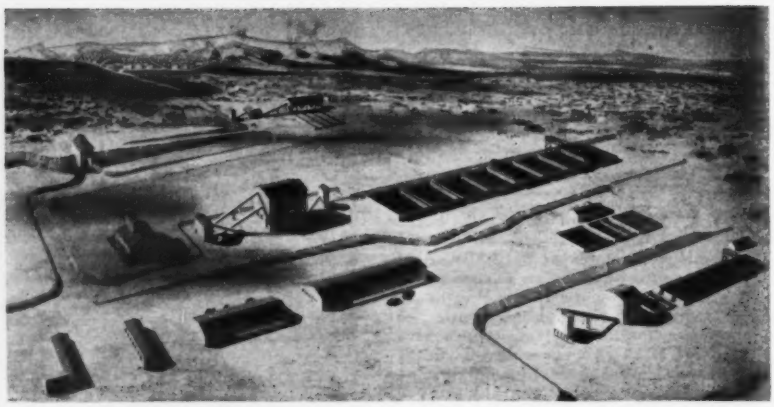
DETROIT 26.....1567 Lafayette Bldg.
HOUSTON 2.....2164 C & I Life Bldg.
LOS ANGELES 17....1570 General Petroleum Bldg.
NEW YORK 6.....1334—165 Broadway Bldg.
PHILADELPHIA 3.....1666-1700 Walnut St. Bldg.
SAN FRANCISCO 4.....1578—200 Bush St.
SEATTLE 1.....1369 Henry Bldg.
TULSA 3.....1667 Hunt Bldg.



ANACONDA COPPER'S YERINGTON PLANT—Shown here is artist's rendering of Anaconda Copper Mining Co.'s plant at Yerington. Open pit mining is scheduled to start before end of 1953. An estimated 60,000,000 lb. of copper per year during first two years and 66,000,000 lb. annually thereafter will be crushed and leached at this plant.

400 tons of agricultural sulphur and 125 tons of pure chemical mineral daily. Refined sulphur will be marketed to sulphuric acid industry.

COPPER BUTTE LEASES MINE—Newly organized Copper Butte Mining Co. acquires a five year lease on Buckskin copper mine west of Yerington. A 50-ton mill is planned at mine site. Property was last worked in 1938 by Ambassador Mine Co.

NEW MEXICO

LAGUNA URANIUM FIND—Bureau of Indian Affairs at Washington gives Anaconda Copper Co. green light to mine uranium on Laguna Indian land near village of Paguate west of Albuquerque. Anaconda will continue search for more uranium in 405,000 acre Laguna reser-

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vation to which company holds a prospecting permit with leasing preference.

NAVAJO URANIUM CO. SELLS PROPERTIES — Kerr-McGee Oil Industries, Inc., of Oklahoma City, Okla., buys mining properties and equipment of Navajo Uranium Co. in New Mexico and Arizona. Uranium mines are located on Navajo Indian reservation in northeastern Arizona, and ore sampling plant is at Shiprock, N. M. Firm plans on increasing mine production, locating new reserves of uranium, and continuing engineering investigations which may lead to construction of a processing mill.

OREGON

WESTERN FAUCET GROWS—Western Faucet Co., Portland, discontinues faucet making to work on a $250,000 expansion program in preparation for manufacturing small aircraft and guided missile parts and assemblies. Remodeling and installation of new equipment at firm's machine shop, 1500 S. E. Gideon St., is nearly completed, and improvements are underway at assembly plant, 506 S. E. Hoyt St. Operation will require about 65 employees.

BARGE CONTRACT FULFILLED—Gunderson Bros. Engineering Corp., Portland, delivers last of 23 steel barges to U. S. Navy, thus fulfilling a $1,750,000 contract.

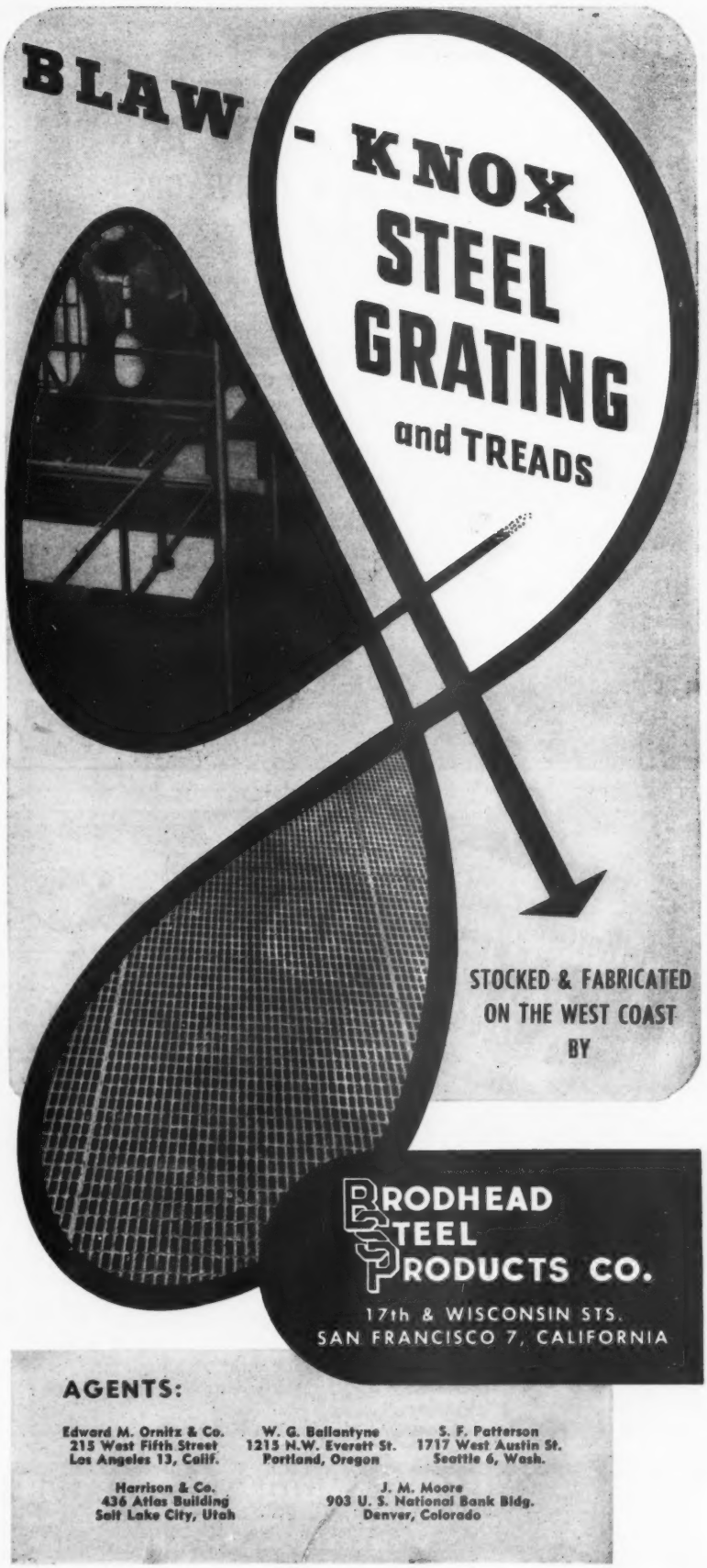
EUGENE PLYWOOD PLANT — Snellstrom Lumber Co., Eugene, and Viking Plywood & Lumber Co., Seattle, Wash., will share a new plywood plant being constructed adjacent to Snellstrom Lumber Co. in Eugene. Plant, with a 3,000,000 sq. ft. monthly capacity, is scheduled to start production in late July.

KAISER GYPSUM BUYS DANTORE PROPERTIES—Kaiser Gypsum division of Henry J. Kaiser Co. acquires Dant, Ore., properties of Dantore Division, Dant & Russell, Inc., Portland. Quarry and plant, situated on Deschutes River, 113 miles east of Portland, produce mineral acoustical tile, lightweight plaster aggregate and trowel coat fines. Expansion program is underway to increase plant's capacity. Quarry has a high grade perlite ore supply sufficient for 50 years of continuous operation at present plant capacity.

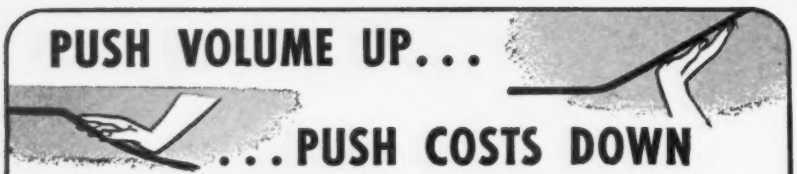
NORTHWEST NUT GROWERS BUILD — Northwest Nut Growers, Dundee, Northwest filbert-walnut co-op, starts construction of a $285,000 central processing plant in North Portland that will also become Association headquarters. New plant will handle walnut shelling, cellophane packaging, vacuum packing of walnuts and shipping, this season. Filbert shelling will come later. Estimated savings of 10 to 15 days in getting Northwest nut crops to market prompts building of new facilities.

UTAH

NEW HAND TOOLS DESIGNED—All Purpose Tool Co., Inc., 1142 S. State, Salt Lake City, has plans for manufacture of hand tools designed for automotive, aircraft and industrial users. Application for original patents on first four tools has been made. They include



PUSH VOLUME UP...



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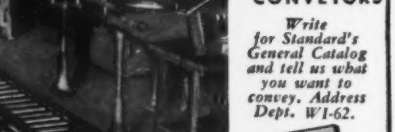

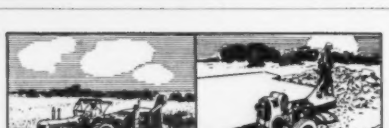

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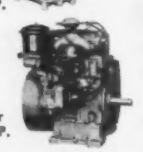

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GILSONITE AGREEMENT—American Gilsonite Co., co-owned by Standard Oil of California and Barber Oil Co., establishes agreement with California Co., Continental Oil Co., and Stanolind Oil & Gas Co. for exploration work in Uintah Basin of eastern Utah. Tests will be made in areas where A. G. C. controlled gilsonite veins are located and on a part of company's privately owned 5,000 acres in Uintah County.

URANIUM DEVELOPMENT ARRANGED—Arrangements are concluded between National Park Service and U. S. Atomic Energy Commission for development and extraction of government owned uranium deposits which may exist at Capitol Reef National Monument, Utah.

DIESEL FACILITY PLANNED—Electro-Motive division of General Motors Corp. plans construction of a $1,500,000 diesel repair and warehouse plant at North Salt Lake, on a 20-acre tract adjacent to Union Pacific Railroad tracks in south Davis County. Plans include a $600,000 brick and concrete building and installation of approximately $900,000 worth of equipment in warehouse and repair shop. Facility will serve all area railroads in addition to equipment operated by Utah and Nevada Mines division of Kennecott Copper Corp. It will furnish 300 men with employment.

WASHINGTON

WASHINGTON-ALASKA TRUCK SERVICE—Alaska Freight Lines, Inc., opens a commercial barge and truck service between Seattle and Tacoma and interior of Alaska. Line, specializing in frozen commodities and express freight, picks up cargo in trailer vans which are sealed and loaded on company barges and towed by tug to Valdez or Anchorage, Alaska. There, vans are unloaded and hauled to cargoes' destinations.

BENDIX BUYS SEATTLE FIRM—Pacific division of Bendix Aviation Corp., North Hollywood, Calif., acquires Photo-Electric Pilot Corp., Seattle, manufacturer of an automatic steering device used on ships. Temporarily, manufacture of pilots will be continued in Seattle.

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with transferral to North Hollywood scheduled for later in summer.

FEED MILL STARTED—Ralston Purina Co. commences building a 60,000 bushel storage elevator and 5,000-ton monthly capacity feed plant in Spokane. Feed production is scheduled to start early next year. Plant will serve Washington and Oregon dealers now obtaining products from Pocatello, Idaho.

COCA-COLA PLANT—Coca-Cola Bottling, Inc., starts work on a new $200,000 plant at Monroe and Mallon streets, Spokane. Plant will have about 26,000 sq. ft. of floor space and will include facilities for processing, bottling and storage. Occupation of building is planned by end of year.

SPOKANE REFINERY MAY CLOSE—Phillips Petroleum Co. may close its Spokane refinery plant because of recent increases in freight rates. Refinery now handles 5,000 to 6,000 barrels of crude oil daily, greater part of which comes by rail from Wyoming and Montana. Interstate commerce commission's new freight hikes will increase cost of crude oil at Spokane by about 12 cents per barrel.

C. KIRK HILLMAN SELLS—C. Kirk Hillman Co., Seattle industrial machinery firm, is purchased by Cyrus W. Ostrom & Associates. Company will continue operations under Hillman name.

EXTRUSION OPERATIONS FOR COLOTRYM—Colotrym Co., producer of steel and aluminum moldings, will install aluminum extrusion operations in its new Seattle plant. New facilities, including a 1,500 ton press will represent $500,000 investment. Small dimension extrusions will be produced for other manufacturers as well as for taking care of company's own needs. Production is expected to start in early fall.

ALLOY MANUFACTURING TO BUILD—Alloy Manufacturing Co. truck and trailer body fabricators, will soon start construction of a $300,000 steel building east of Geiger field, Spokane County.

WYOMING

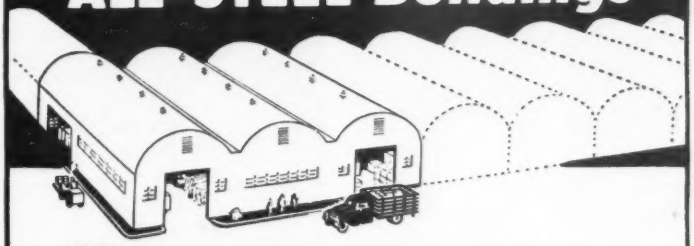
ALUMINA PLANT MAY BE USED FOR COAL STUDY—U. S. Bureau of Mines studies possibility of research on developing energy from low-rank coals at its Laramie alumina plant. Studies under consideration are: coal usage without drying, coal usage with drying and no carbonization, usage of dried and carbonized coal, liquid fuel usage.

WYOMING URANIUM SEARCH — A U. S. government report indicates that recently discovered uranium deposits in Wyoming and South Dakota point to an entirely new area favorable for uranium prospecting. Interior Department is making a large block of public land in Pumpkin buttes area of northeastern Wyoming available for further exploration.

SULPHUR MINE REACTIVATED—Sulphur mine near Auburn will resume operations this summer under name of Stanco Sulphur Products, with offices in Afton. Sulphur produced at mine will be used for insecticides and marketed in pellet form. It will be shipped to Cokeville railhead in bulk.

ALL-PURPOSE BUILDING FOR INDUSTRY

STRAN-STEEL LONG-SPAN ALL-STEEL Buildings



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WESTERNERS AT WORK

California

MARVIN S. BANDOLI, former vice president of *Clary Multiplier Corp.*, is appointed vice president of marketing and research for *Plomb Tool Co.*

Western Electrochemical Co., Culver City, appoints ROBERT S. BURNS as president, succeeding KENNETH WALSH, newly elected chairman of the executive committee.

Robert S. Burns

W. C. WHITEHEAD is named acting general manager of *The Garrett Corp.*, Los Angeles, in the absence of J. C. GARRETT, president, who is taking an extended rest. Whitehead joined firm in 1938 and has been a vice president since 1942. S. K. ANDERSEN is appointed chief engineer of Garrett's subsidiary, *AiResearch Manufacturing Co.*, Los Angeles. IVAN SPEER, assistant project engineer on gas turbine engines for AiResearch Manufacturing Co., Los Angeles, is transferred to Phoenix, Ariz., to assume duties as engineering manager, *AiResearch Manufacturing Co. of Arizona*. Speer replaces ARTHUR J. PHELAN, who returns to AiResearch, Los Angeles, as staff engineer.

EDWARD J. DUFFY, general superintendent at *Kaiser Steel Corp.*, Fontana, is appointed assistant to works manager, in charge of iron ore and coal production at company-owned

Duffy *Dagan*

mines at Eagle Mountain, Calif., and Sunnyside, Utah. He is succeeded by BARNEY DAGAN, formerly assistant superintendent. New assistant superintendent is JACK B. KLUKKERT. Klukkert, who joined Kaiser in 1947, has been assistant superintendent at Coulson since 1950.

E. L. OLIVER, JR., takes over new duties as executive vice president for *Oliver United Filters, Inc.* Oliver was vice president-manager before this advance.

E. L. Oliver

Weber Aircraft Corp., Los Angeles, promotes HAROLD JOHNSON, chief sales engineer, to product development manager.

PAUL F. VOIGT, JR., joins *Solar Aircraft Co.*, San Diego, as consultant to president on marketing methods and development of new products. In 1936 Voigt organized stainless steel division of what is now *U. S. Steel Co.*, and managed that division until his retirement in 1952. ELLIOT C. BACON is named as-

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sistant manager of Solar's research products division.

Northrop Aircraft, Inc., Hawthorne, designates LEWIS A. NELSON as supervisor in charge of engineering test pilots. Nelson has been an engineering test pilot for the firm since September 1950.

ROBERT C. CHASE becomes superintendent of production for *Helipot Corp.*, South Pasadena. Was formerly with *General Mills*, Minneapolis, in a production supervisory capacity.

JOHN R. FELTON, industrial wage analyst, is appointed director of Los Angeles office of Wage Stabilization Board for California, Arizona and Nevada, succeeding DONALD STRAUSS, who resigns to return to his former position in the Industrial Relations Division of *Douglas Aircraft Co., Inc.*

Hoffman Laboratories, Inc., Division of Hoffman Radio Corp., Los Angeles, names JOHN H. GANZENHUBER as manager of government contracts department. Ganzenhuber resigned as vice president of *Standard Electronics Corp.*, New York, to join Hoffman. J. T. MCALLISTER is new factory service manager for *Hoffman Sales Corp.*, another *Hoffman Radio Corp.* division.

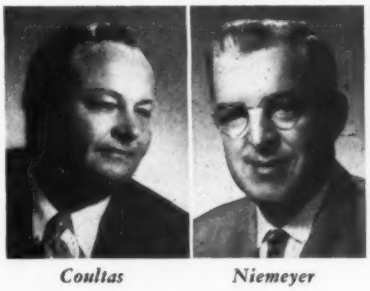
LLOYD R. EARL, formerly vice president of *Consolidated Western Steel Corp.*, is elected president of *United Concrete Pipe Corp., U. S. Pipe & Foundry Co.* subsidiary.

National Motor Bearing Co., Inc., Redwood City, elects ROBERT ELDRIDGE as secretary. Eldridge was formerly office manager and assistant comptroller. CLIFFORD A. STEPHENS, former senior compounding engineer for *Firestone Tire and Rubber Co.*, Akron, Ohio, joins National Motor Bearing as chief rubber technologist.

J. T. CATALDO joins *International Rectifier Corp.*, El Segundo, as assistant general manager.

J. WARREN GILLON assumes newly established post of works manager for *Dalmo Victor Co.*, San Carlos. Gillon served *Librascope, Inc.*, Glendale, as assistant production manager before joining Dalmo Victor.

HAROLD NIEMEYER is new assistant to area manager of *Western Gear Works'* Lynwood



Coultas *Niemeyer*

plant. STAN COULTAS, formerly superintendent, is named production manager.

Beta Gamma Sigma, national honorary fraternity in collegiate schools of commerce and business administration, through its chapter at the *University of Southern California*, Los Angeles, has voted its "man of the year" and its only 1952 honorary member in the person of DR. RALPH L. POWER, Los Angeles radio counsellor. Dr. Power, who was a professor of economics at USC more than three decades ago, is editor of

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the *Hoffman* (Radio Corp.) *Transmitter,* and executive secretary-treasurer of the Los Angeles Chapter of Representatives (Electronics).

J. KENNETH RANKIN, partner in *Creative Metals Co.,* Emeryville, is appointed a member of the Tackle Block Manufacturers Industries Advisory Board of National Production Authority.

DR. RALPH M. BARNES, professor of production management and engineering on the Los Angeles campus of the *University of California,* receives the National Industrial Incentive Award from *Society for Advancement of Management.*

JOHN J. OLIPHANT, production superintendent of *General Petroleum Corp.'s* San Joaquin division, is advanced to post of superintendent, succeeding D. G. KINGMAN, newly appointed assistant manager of joint venture operations.

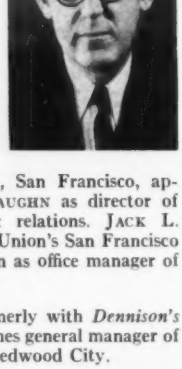
EARL F. WARNER is new factory manager of El Segundo plant of *Nash Motors Division, Nash Kelvinator Corp.* Warner has been assistant general superintendent of Nash's main automobile plant at Kenosha, Wis., since 1950.

WORTH LARKIN reassumes duties as head of publicity department of the *Los Angeles Chamber of Commerce* after a 20-month tour of active service with Southern California's 40th Infantry Division.

Aircraft Engineering and Maintenance Co., a subsidiary of *Transocean Air Lines,* names DOUGLASS F. JOHNSON as president. He has been serving as executive vice-president of AEMCO and as sales director of Transocean Air Lines during recent years.

WILSON C. HANNA, chief chemist, *California Portland Cement Co.,* Colton, is named vice president in charge of technical development.

JOHN M. LUND, formerly vice president and general manager of *Friden Calculating Machine Co., Inc.,* is elected executive vice president and general manager. LAWRENCE B. TAYLOR, formerly general sales manager, is promoted to newly created position of vice president in charge of sales. Assuming duties as vice president and assistant general manager is PHILIP R. SAMWELL, formerly controller. HARRY M. BILLINGS is appointed assistant secretary and VICTOR C. BERDS is new assistant treasurer.



John M. Lund

Union Lumber Co., San Francisco, appoints BERNARD J. VAUGHN as director of industrial and public relations. JACK L. PRYOR, accountant at Union's San Francisco office, succeeds Vaughn as office manager of the Fort Bragg office.

CARL ROBERTS, formerly with *Dennison's Foods,* Oakland, becomes general manager of *S & W Fine Foods,* Redwood City.

Birds Eye Division of General Foods, Santa Cruz, names WILLIAM H. WALTON as production foreman. Walton was formerly personnel manager at the firm's quick-frozen plant in Yakima, Wash.

Douglas Aircraft Co., Inc., elects as vice president JAMES SIMPSON, former Long Beach division general manager. M. A. KAVANAUGH, former assistant treasurer, promoted to controller.

New general manager of *U. S. Honing Co.,* Long Beach, is J. HOWARD BATCHELOR, former chief of materiel for Santa Monica division of *Douglas Aircraft Co., Inc.* He will be assisted by JAMES R. RICHARDS.

WILLIAM T. POWELL, former executive vice president of *Emsco Derrick & Equipment Co.,* Los Angeles, is advanced to president and chief executive officer.

Colorado

WILLIAM H. KING, Denver, is appointed executive officer of *Defense Minerals Exploration Administration's* field team in Region IV.

THOMAS P. FAHEY is named superintendent of Arkansas Valley smelter of *American Smelting and Refining Co.,* Leadville, succeeding LEO HENNEBACH, retired.

Idaho

JOHN R. MATTHEWS, Wallace, is promoted from chief accountant to secretary-treasurer of *Hecla Mining Co.,* succeeding L. J. RANDALL, newly elected president.

Montana

ROBERT A. BLAKE, mill superintendent of *Mike Horse Mining and Milling Co.,* Mike Horse, which is owned by *American Smelting and Refining Co.,* is advanced to mill superintendent of parent company's new 1,000-ton Van Stone mill at Onion Creek, Wash.

Newly elected president of *Sullivan Valve and Engineering Co.,* Butte, is JAMES C. KELLY, who has been with the firm since 1932.

New Mexico

DANIEL L. HIGGINS, former chief of the Construction Contracts Section and assistant chief of Supply and Contracts Branch at Los Alamos, is promoted to position of procurement specialist in Supply Division of U. S. Atomic Energy Commission's Santa Fe Operations Office at Albuquerque. Newly reorganized Personnel Branch at U. S. Atomic Energy Commission's Santa Fe Operations Office replaces the former Personnel and Training Branch which will be headed by CHARLES C. CAMPBELL, former P & T Branch chief, who also serves as assistant director of personnel and organization.

Oregon

Portland General Electric Co. appoints WALLACE E. GORDON as assistant to vice president in charge of operation, succeeding C. W. BRISSENDEN, recently appointed sales manager.

EARL F. ANDERTON becomes plant manager of the Empire, Ore., mill of *Coos Bay Pulp*

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Corp., a *Scott Paper Co.* subsidiary, replacing HENRY S. GODSHALL, JR., who will fill newly created position of production manager of Fort Edward, N. Y., plant of *Marinette Paper Co.*, another Scott subsidiary.

Utah

GEORGE R. WATKINS, former acting manager, becomes general manager of *United States Fuel Co.*, Salt Lake City.

RICHARD E. HOAGLAND, vice president and general manager of the former *Utah Fuel Division, Kaiser Steel Corp.*, is appointed assistant to vice president in charge of industrial relations for Kaiser's steel operations at Fontana, Calif., company owned mines at Sunnyside, Carbon County, and iron ore mining at Eagle Mountain, Calif.

L. C. JONES is named chief engineer of *Utah Copper Division, Kennecott Copper Corp.*, succeeding GEORGE C. EARL, retired. Other personnel changes in this division include the following: L. F. PETT, general superintendent of mines, advanced to general superintendent of operations; J. C. LANENBERGER, JR., director of labor relations, succeeds Pett; V. S. BARLOW, assistant mine superintendent, named mine superintendent; JOSEPH A. NORDEN, JR., assistant general drilling and blasting foreman, succeeds Landenberger; JAMES K. RICHARDSON, industrial engineer for Kennecott's Western Mining Division, becomes assistant to general manager in charge of public, industrial and labor relations.

Washington

JOHN M. HAYDON, former public relations director for *Port of Seattle*, assumes post of public relations manager, *Bardahl Oil Co.*, Seattle.

Simpson Logging Co. names JOSEPH E. MUCKLEY as vice president and treasurer. Muckley was formerly vice president of *Seattle First National Bank*.

ALBERT HANSON, former national sales director, is appointed plant manager of *Drayer-Hanson, Inc.*, Seattle. ROSS RATHBUN succeeds Hanson.

Rayonier, Inc., transfers STEVE RUPERT from Fernandina, Fla., division to Grays Harbor as assistant to resident manager.

RAYMOND C. ANDERSON, vice president, elected president of *Alaska Pacific Salmon Co.*, succeeding GILBERT W. SKINNER. R. J. BEHNKE named treasurer, replacing M. H. KEIL, retired; and A. L. CAHILL becomes assistant secretary succeeding D. E. SKINNER, retired.

PROF. J. KENNETH PEARCE is named acting technical director of *Washington Institute of Forest Products*, Seattle, succeeding RALPH G. DEMOISY, who joins *M and M Wood Working Co.* C. JACK KANTZER becomes assistant technical director.

ASSOCIATIONS ELECT

Timber Products Manufacturers' Association: President, J. H. LEUTHOLD, head of *Deer Park Lumber Co.*, Spokane; vice president, HARRY G. PRESTON, Columbia Falls, Montana; treasurer, L. R. PUGH, St. Maries, Idaho, secretary, GEORGE G. TICHY, Spokane.

American Society of Mechanical Engineers, Southern California Section: Chairman, C. M. SANDLAND, *C. F. Braun and Co.*; vice chairman, FRANK BAEYERTZ, *General Petroleum Corp.*; secretary-treasurer, L. F. RICHARDSON, *Bailey Meter Co.*

Mining Association of Montana, Helena Chapter (Last Chance Gulch Mining Association): President, JOHN BROPHY, *Franklin Mine*, Helena; program vice president, JACKSON NICHOLS, metallurgist for *A. S. & R. Co.*, East Helena; membership vice president, HERBERT OBENDORF, *Montana Rainbow Engineering Co.*, Helena; publicity vice president, CHARLES R. BRAZIER, Helena; secretary-treasurer, HUGH K. GAW, public accountant, Helena.

United Employers, Inc.: President, HARMON HOWARD, secretary of *Howard Terminal*, Oakland; vice presidents, CHARLES H. WOESSNER, partner, *Boxcraft Paper Box Co.*, Oakland; A. E. MCINTYRE, general manager, *Malsbary Manufacturing Co.*, Oakland.

National Association of Manufacturers, government contracts committee: Members, GEORGE FAY, vice president and comptroller, *Rheem Manufacturing Co.*, Richmond; C. W. SWENSON, secretary, *Carl N. Swenson Co., Inc.*, San Jose; J. R. TRAVIS, president, *Eaton Metal Products Co.*, Denver.

California State Chamber of Commerce: President, NEIL PETREE, president, *Barker Brothers Corp.*, Los Angeles; first vice president, ALDEN G. ROACH, president, *Columbia-Geneva Steel Division, U. S. Steel Corp.*, San Francisco; second vice president, WILLIAM C. MULLENDORE, president *Southern California Edison Co.*, Los Angeles; third vice president, JOHN E. CUSHING, *Matson Navigation Co.*, San Francisco.

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Gear making is a specialist's job. Johnson Gear standards are built around the ability to skillfully produce gears to exacting American Gear Manufacturers' Association specifications. The Johnson Gear organization has the technical "know how" and experience to build carefully and dependably a finished product that will give noteworthy performance.

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Titeflex, Inc., Newark, N. J., manufacturer of electrical connectors, flexible metal hose and shielding conduit, rigid and flexible waveguides and expansion-type bellows, appoints WILLIAM BUCKLEY as West Coast sales representative with offices at *Salsbury Corp.*, 1161 E. Florence Ave., Los Angeles.

Carl Hirschmann Co., Los Angeles, is appointed exclusive representative for *Ebosa, S. A.*, Grenchen, Switzerland. Company will import Ebosa's line of turning and thread chasing machines, second-operation machines, hardness testers, and measuring machines.

Western TRADE WINDS

News about those who distribute and sell industrial equipment and materials

Clingan & Fortier, Inc., steel and aluminum distributors on the West Coast, add new equipment, additional lines, and more salesmen to cover their Los Angeles territory. C & F also open a new Seattle warehouse at 1047 6th Ave. Los Angeles headquarters have been moved to 2929 Santa Fe Ave.

ARTHUR S. BOEHM takes newly created position of Pacific Coast district sales manager for *Black & Decker Manufacturing Co.* He will be in charge of all Black & Decker branches in Los Angeles, San Francisco, Seattle and Portland. For past five years he has been San Francisco branch manager.

Arthur S. Boehm

Joy Manufacturing Co., Pittsburgh, Pa., opens new sales office and warehouse at 5426 E. Washington Blvd., Los Angeles. T. G. WEIR, formerly in charge of Seattle district office, becomes district manager, Los Angeles area.

DONALD T. BOODY is named Pacific Coast sales engineer for industrial products manufactured by *Parker Appliance Co.*, Cleveland, Ohio. He headquarters at Los Angeles.

RUDYARD R. OLSON joins Seattle district office of *Allis-Chalmers Manufacturing Co.'s* general machinery division as sales representative. *Adelman Machinery Co.*, 520 First Ave. South, Seattle, is appointed a distributor for Allis-Chalmers motors in King, Whatcom, Clallam, Jefferson, Chelan, Kittitas, Yakima, Benton, Franklin, and Walla Walla counties in Washington.

EDWARD C. STERLING, JR., becomes Western division sales manager for *Townsend Co.*, New Brighton, Pa. His headquarters will be at firm's Cherry Rivet Division offices in Los Angeles. Sterling replaces EDWARD H. STAU, resigned.

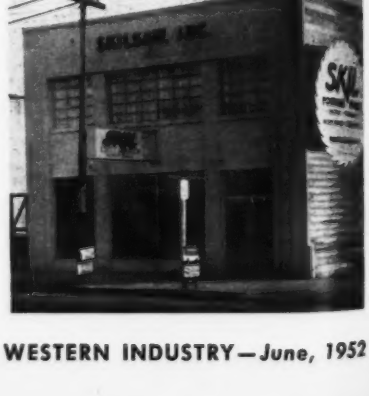
Roylyn, Inc., producer of couplings, valves and related industrial products, appoints FRED B. PARKER supervisor of customer relations. His headquarters are at Roylyn, Inc.'s general offices in Glendale, Calif.

Robert T. Jones is named field engineer for Western states by *Chiksan Co.*, with headquarters at company's main plant in Brea, Calif. He will specialize in hydraulic applications of ball-bearing swivel joints, assisting in design and layout and rendering technical service to Chicksan customers.

Heat and Control, Inc., moves to new quarters at 270 Seventh St., San Francisco. Company is appointed West Coast distributor for: *Askania Regulator Co.*, Chicago, Ill., web, flow, ratio and pressure controls; *Bloom Engineering Co.*, specialized combustion equipment; *Paulsen-Johnson Co.*, specialized regulators.

Republic Supply Co. of Calif. opens a branch office in Phoenix, Ariz., at 405 E. Roosevelt St. Office is under direction of ROBERT E. TEMPLE, industrial sales manager, southern division; FORREST L. MORELL is salesman; and ROGER HENDRICKSON is office manager. Republic Supply also absorbs its San Jose branch into northern division headquarters and warehouse at San Leandro, Calif., and is in process of liquidating its manufacturing division.

Here is *Skilsaw, Inc.'s* new building, located at 285 Van Ness Avenue, San Francisco. Building contains 4,000 sq. ft. of floor space, plus a parking lot for patrons.



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PHOSPHORIC ACID 75% Food Grade – 85% N. F.

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Division of Victor Chemical Works
4578 ARDINE STREET
SOUTH GATE, CALIFORNIA
Telephone: Kimball 2214

James P. Kinney Co., exclusive *Yale & Towne Manufacturing Co.* distributor in Los Angeles, Arizona, New Mexico area, moves to new location at 5141 Anaheim Telegraph Road, Los Angeles 22, Calif.

Beckman Instruments, Inc., South Pasadena, establishes a new special products division under direction of J. F. BISHOP. Function of department is study and development of special instruments brought to it by industrial organizations.

Bishop *Olympius*

H. J. OLYMPIUS is appointed manager of pipe, valve and fitting department of *Triangle Steel & Supply Co.*, Los Angeles.

J. E. Haseltine & Co. is appointed distributor for *Gorham Tool Co.*, Detroit, Mich. J. E. Haseltine & Co. maintains offices and warehouse facilities in Portland and Eugene, Ore., Seattle, and Spokane, Wash.

Forty sales representatives of *C. A. Norgren Co.* attended a national sales conference held at factory in Englewood, Colo., May 19-22.

Gustin-Bacon Manufacturing Co., Kansas City, Mo., producer of Ultralite glass fiber insulation, extends distributing territory of *Western Fiberglas Supply Co.*, San Francisco, to include entire Pacific Coast and Alaska. New offices are now open in Seattle, Wash. Branches in Spokane, Wash., Portland, Ore., and in Alaska will soon open.

WARREN C. CORDANO, owner of *Cordano Chemical Co.*, Portland, Ore., will act as agent for *Morehouse Industries* milling equipment. Office and warehouse will be maintained at 0618 S.W. Gibbs St., Portland, Ore.

H. RAYMOND HOGABOOM is new district manager for *Enterprise Engine & Machinery Co.* in Los Angeles. He replaces P. B. ERWIN, retired from active business life.

ACF-Brill Motors Co., Philadelphia, Pa., appoints *Western Tool & Manufacturing Co.*, Casper, Wyo., as dealer in Rocky Mountain area for *Hall-Scott* industrial engines and service parts. JOHN W. TUCKER, formerly sales manager for *Hall-Scott Engines* in Southern California is appointed manager of industrial engine sales for *Cummins Service and Sales Co.*, Los Angeles.

Westinghouse Electronic Tube Division appoints WALTER J. MAYTHAM Pacific Coast district manager. His headquarters are in Westinghouse's Los Angeles office.

Federal Shock Mounts, New York, N. Y., appoints *G. S. Marshall Co.*, Pasadena, Calif., its California, Arizona and New Mexico representative.

Uarco, Inc., changes staff as follows: KONRAD MUEHSAN is transferred to Portland as

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FLEXIBLE CORRUGATED
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PROTECTIVE PACKAGING
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San Francisco

The Lufkin Line

By VIC FAWCETT

"HELP WANTED"

Vic Fawcett

Hi there, you folks up in the Pacific Northwest in the land of Paul Bunyan! And Howdy, Podners out there in the hard-rock mining country from Randsburg to Reno, from Tonopah to Tucson, from Santa Fe to Skagway! Let's swap facts and fables, terms and tales of your respective industries—or from other industries, too.

Just for example, in the Oil Industry, Lufkin is almost a legend in itself, but here are some of the colorful terms we hear everyday of our lives. And if your yarn is really good, we'd like to submit it to our Editor for use in our magazine, *The Lufkin Line*.

"WILDCAT"—an exploratory oil well.

"DUSTER"—Dry oil well. Very unsuccessful.

"KELLEY"—Spare 30 ft. top member on string of drill pipe—turned by rotary table which in turn drives drilling pipe and bit.

"RAT-HOLE"—Shallow diagonal hole to receive "Kelley" while drill pipe is being removed.

"ROUGHNECK"—member of drilling crew.

"SAMPSON POST"—supports beam on oil well pumper.

"WALKING BEAM"—steel or wood beam on oil well pumper bobs up and down, operating sucker rods.

Submit your glossary of words or pictures—or your fabulous fable—on your company letterhead, to this writer, address below.

NEWS FLASH!!!

IT'S NOT ALL IN THE OIL FIELDS—Lufkin Gear Reducers, known for fine performance and long life, have been specified by Foster Wheeler Corporation in the new Glendale, Calif., power plant cooling towers. AND—Southern Pacific R.R. installs Lufkin Gears in L. A. Shops to speed up car wheel production!

And That's No Fable!!!

Vic Fawcett

PACIFIC COAST DIVISION
5959 S. Alameda St., Los Angeles 1, Calif.
AGENCY—ADAM HILL CO.
244 - 9th St., San Francisco, Calif.

Dallas **Lufkin, Texas** **New York**

Pictured here are newly elected officers of Materials Handling Association of Southern California for fiscal year 1952-1953. Reading from left to right are: *Russell J. Leek*, Calabar Corp., vice president; *W. H. Kilkenny*, Hyster Co., past president; *Harry R. Butler*, Richards-Wilcox Manufacturing Co., president elect; and *J. E. Badgley*, Western Industry, secretary-treasurer.

Uarco city manager there; J. N. FRIEDMAN, vice president and general manager of Western division, heads Emeryville headquarters; J. J. KRAL resigns.

Two new management consultants, H. C. WATTS and DAVID C. HONEY, are added to staff of *McKinsey & Company*, management consulting firm with Los Angeles offices in General Petroleum Building.

Oil Well Manufacturing Corp., Los Angeles, makes O. W. MORGAN general sales manager for Red Devil products. Morgan was previously with *Byron Jackson Co.*

T. BRUCE SELFRIDGE, formerly sales manager for *Moore Dry Dock Co.*, is new general sales manager for *Columbia Machine Works*, Berkeley, Calif.

HUBERT A. DESMARAIS is made general sales manager of *Pennsylvania Salt Manufacturing Co. of Washington* with headquarters at Pennsalt of Washington's central office in Tacoma. He has been Pacific Coast sales manager for *General Dyestuff Corp.* in San Francisco.

Rivett Lathe & Grinder, Inc., Boston, Mass., appoints *Paul-Munroe Co.*, 4867 E. Gage Ave., Bell, Calif., as Los Angeles and Southern California representative for its line of air and hydraulic valves and cylinders and hydraulic power units.

Tubesales, Los Angeles distributor of steel tubing, appoints ELVIN A. SVENDSEN its sole Northern California agent. His offices are at 268 Market St., San Francisco.

GEORGE DAVIS, Los Angeles electronic engineering representative, changes his business name to *George Davis Co.*, and moves to larger quarters at 5259 East Beverly Blvd., Los Angeles 22.

Sprague Electric Co., North Adams, Mass., establishes a Pacific Coast application engineering office and radio noise suppression laboratory at 11325 Washington Blvd., Culver City, Calif. New California representatives are, top row, left to right: THOMAS S. BILLS, office manager; JOHN J. FISKE, DANA GRINDY, GEORGE S. KARIOTIS; bottom row: PAUL M. KUEFLER, FRED J. NICHOLS and LLOYD E. WEST.

Space is sold as advertisers' inches
All advertisements in this section are ⅛ inch short of contracted space to allow for borders and composition.

CLASSIFIED SECTION

Rates are $7.50 a column inch. Copy should be sent in by the 25th of preceding month if proofs are required; by the 28th if no proofs are required.

FOR SALE:

Turbine-generator equipment in good operating condition, consisting of the following:

1—General Electric generator, Model 6G650, Type ATB, Frame 7653, Form BL, 3 phase, 60 cycle, 250 KVA, 480 volt, 300 amp, 1200 RPM, excitation 125 volt, 20.2 amp, 200 KW8PF, No. 5370978, direct connected to

1—General Electric steam turbine, 200 KW, 5529 RPM, Type DS-60-4 stage, 160# pressure, exhaust pressure 2" absolute, No. 40798.

1—Worthington Surface Condenser, Size 300 sq. ft., complete with 8" atmospheric relief valve (less pump).

1—General Electric DC Generator, Model 15G706, Frame 5, Type EF, Form EB, 24 amp, 3 KW, 1200 RPM, No. 1702735 (Exciter) attached to generator.

1—General Electric Speed Reducer, Type S58, 5529 to 1200 RPM.

1—Ansdale Oil Cooler, Size H2, (oil feed to turbine).

1—General Electric Switchboard including DC voltmeter, AC kilowatt meter, AC and DC Ammeters, resistance rheostat, voltage regulator, watt hour meter, 3 potential transformers 400 Amp, 3 current transformers 480-115 volt, circuit breaker hand operated, voltage regulator—carbon pile, exciter armature voltage stabilizer, field switch.

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NEW MOTORS

IMMEDIATE DELIVERY!

General Electric — Westinghouse
Louis Allen

¾ - 2 - 10 - 15 - 20 HP, 1200 RPM, 220/440 - 3 - 60 Motors

5 - 7½ - 25 HP, 1800 RPM, 220/440 - 3 - 60 Motors

1½ and 25 HP, 1200 RPM, 550 volt - 3 - 60 Motors

20 HP General Electric Gear Reducer motors equipped with heavy duty solenoid operated brakes, 220/440 volt

One (1) 1800/900 RPM, two-speed motor, 5 - 2½ HP, 440 volt, 3 - 60

All subject to prior sale

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STETSON-ROSS MACHINE COMPANY
Seattle 4, Washington Main 4188

FOR SALE:

1—Model SHA Triangle Automatic Power Feed Net Weigher, new, never used, complete with material feed hopper, dust hood, and ½ HP AC 110/220 volt GE Cap. motor, $800.00 FOB, California. New factory cost $1090. FOB Chicago.

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609 Mission Street, San Francisco 5, Calif.

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ETCHING COMPANY OF AMERICA
55 New Montgomery Street
DOuglas 2-8434 San Francisco, Calif.

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See rates at top of page . . . Send in your list now, specifying size of ad you want—we'll do the rest. Write today to . . .

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Practical, Down-to-Earth Welding Rods
Alloys as they are supposed to be

Corrosion Resistant—
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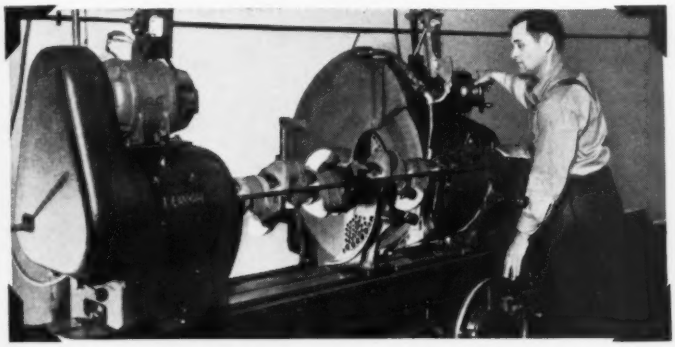
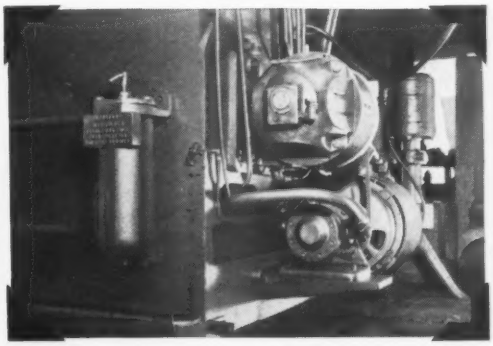
STANDARD ENGINEER'S REPORT

DATA

LUBRICANT	Calol O. C. Turbine Oil
APPLICATION	Hydraulic medium
UNIT	Control on hydraulic grinder Landis type C— 36 in wheel
SERVICE	Crankshaft and cylinder grinding
FIRM	Crankshaft Co., Los Angeles

Inhibited oil saves $1000 per year in "down time"!





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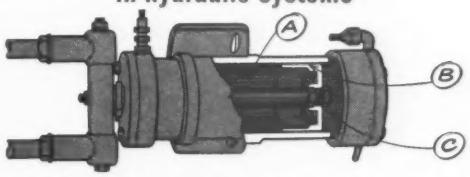

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A. Contains very effective oxidation inhibitor—will not deteriorate and plug lines and retard action of cylinders.

B. Corrosion inhibitor prevents rusting and pitting—has high metal-wetting ability.

C. Separates readily from water or other contaminants—dirty oil may be reclaimed easily...charge lasts indefinitely, leakage only cause for replacement.

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New Port Facility **Handles Ores Faster** at **Lowest Cost Per Ton!**

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As a whole, and in detail, this heavy-duty system typifies the many and diversified bulk materials handling installations planned and outfitted by S-A engineers during the past half century. The S-A engineer is able to recommend the most practical combination of equipment units for each specific job—because Stephens-Adamson makes *all* types of bulk conveying equipment.

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Port of Baltimore, Maryland

Grab buckets bring up 15 tons from the ship's hold in each "bite." Ore is deposited in the receiving bins of two giant movable unloading towers. In turn, the ore passes through S-A "Amsco" Pan Feeders in a measured flow to an 867-foot S-A Belt Conveyor. This travels horizontally under the towers and then up an incline to a 500-ton bin above the railroad tracks. Ore is again fed by pan feeders into weigh hoppers where it is weighed in carload lots and discharged through S-A power-operated gates to cars spotted below.

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2227 E. 37th STREET, LOS ANGELES 58, CALIF.

Washington Machinery & Storage Co.
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Bulk Material Handling Equipment